SITE HEALTH AND SAFETY PLAN

YERINGTON MINE
SITE CLOSURE

YERINGTON MINE SITE
LYON COUNTY, NEVADA

REVISION 2: NOVEMBER 21, 2002

PREPARED FOR:

ATLANTIC RICHFIELD COMPANY

PREPARED BY:

BROWN AND CALDWELL

Carson City, Nevada

Atlantic Richfield Company

307 East Park Street
Suite 400
Anaconda, Montana 59711
Phone: (406) 563-5211
Fax: (406) 563-8269

December 5, 2002

Arthur G. Gravenstein
Staff Engineer
Bureau of Corrective Actions -- Remediation Branch
Nevada Division of Environmental Protection
333 W. Nye Lane
Carson City, Nevada 89701

Subject: **Revised Site Health and Safety Plan**
Yerington Mine Site, Lyon County, Nevada

Dear Art:

Atlantic Richfield Company has prepared the attached revised Site Health and Safety Plan for the Yerington Mine Site.

If you have any questions regarding the revised Site Health and Safety Plan, please call me at 1-406-563-5211 ext. 430.

Sincerely,

Dave McCarthy
Project Manager

cc: Bonnie Arthur, SFD-8-1, USEPA Region 9
Kris Doebbler (BLM)
Tad Williams, Walker River Paiute Tribe
Robin Bullock, Atlantic Richfield Company
John Krause, Bureau of Indian Affairs
Stan Wiemeyer, U.S. Department of the Interior, Fish and Wildlife Services Division
Vicki Roberts/Johanna Emm, Yerington Paiute Tribe
Elwood Emm, Yerington Paiute Tribe
Paul Thompsen, Office of Senator Harry Reid
Phyllis Hunewill, Lyon County Commissioner
Joe Sawyer, SRK Consulting
Dietrick McGinnis, McGinnis and Associates
Ed Bates, EPA-ORD

BROWN AND CALDWELL
SITE HEALTH AND SAFETY PLAN
YERINGTON MINE SITE CLOSURE

Prepared by:_____ Date: _____
Brian D. Bass, P.E.
Brown and Caldwell Site Health and Safety Coordinator

Reviewed/approved by:_____ Date: _____
Chuck Zimmerman
Brown and Caldwell Project Manager

Reviewed/approved by:_____ Date: _____
Anne Baptiste
Brown and Caldwell Corporate Health and Safety Manager

Reviewed/approved by:_____ Date: _____
Lorri Birkenbuel
Atlantic Richfield Health and Safety Representative

Reviewed/approved by:_____ Date: _____
Dave McCarthy
Atlantic Richfield Project Manager

Accepted by:_____ Date: _____

Accepted by:_____ Date: _____

Accepted by:_____ Date: _____

Accepted by:_____ Date: _____

Accepted by:_____ Date: _____

Accepted by:_____ Date: _____

BROWN AND CALDWELL	Site Health and Safety Plan Safety Plan Implementation Checklist	
Project Name	Project Location (city and state)	Date
Name of Site Safety Coordinator	Weather Conditions	Project Number

BC Staff Present

Name	Office

Indicate the status of each of the following:

1.	Is a copy of the Site Safety and Health Plan (SSHP) on site?	☐ YES	☐ NO	☐ N/A
2.	Is the personal protective equipment required by the SSHP available and being used correctly?	☐ YES	☐ NO	☐ N/A
3.	Have the work zones been delineated?	☐ YES	☐ NO	☐ N/A
4.	Has a decontamination station been set up as required by the SSHP?	☐ YES	☐ NO	☐ N/A
5.	Are the decontamination procedures being followed?	☐ YES	☐ NO	☐ N/A
6.	Is access to the exclusion zone being controlled?	☐ YES	☐ NO	☐ N/A
7.	Has the site activities briefing and tailgate safety meeting been provided?	☐ YES	☐ NO	☐ N/A
8.	Is the list of emergency telephone numbers posted at the support zone?	☐ YES	☐ NO	☐ N/A
9.	Are directions to nearest emergency medical assistance posted at support zone?	☐ YES	☐ NO	☐ N/A
10.	Is emergency equipment available and functional, as required by the SSHP?	☐ YES	☐ NO	☐ N/A
11.	Has the nearest toilet facility been identified or a portable facility been set up?	☐ YES	☐ NO	☐ N/A
12.	Has an adequate supply of drinking water been provided?	☐ YES	☐ NO	☐ N/A
13.	Has water for decontamination been provided?	☐ YES	☐ NO	☐ N/A
14.	Have the instruments for environmental and exposure monitoring been calibrated and set up as required by the SSHP?	☐ YES	☐ NO	☐ N/A
15.	Are the instruments being used properly and periodically checked during the shift for battery charge status?	☐ YES	☐ NO	☐ N/A
16.	Have the trenches and excavations been clearly marked?	☐ YES	☐ NO	☐ N/A
17.	Have trenches and excavations been shored or sloped as required by soil type and work activities?	☐ YES	☐ NO	☐ N/A
18.	Are dust suppression measures being used?	☐ YES	☐ NO	☐ N/A
19.	Is food and tobacco consumption being restricted to the support zone?	☐ YES	☐ NO	☐ N/A
20.	Has a confined space been identified as part of this project?	☐ YES	☐ NO	☐ N/A
21.	Are the confined space entry procedures being correctly implemented?	☐ YES	☐ NO	☐ N/A
22.	Has the work/rest cycle for the shift been established?	☐ YES	☐ NO	☐ N/A

TIME ON (minutes): _____ TIME OFF (minutes): _____

23.	Has a shaded rest area been set up in the support zone?	☐ YES	☐ NO	☐ N/A

Table 1. Emergency Telephone Numbers for the Yerington Mine Site

EMERGENCYS: CALL 911

LOCAL TELEPHONE ROSTER

POLICE, FIRE, AND AMBULANCE			
Elko County Sherrif Dept.	775 W. Silver St. Elko, NV	Tel 775-738-3421	Neil Harris
Yerington Fire Dept.	See Mason Valley Fire Dept	See Mason Valley Fire Dept	Chief: Steve Tognoli
Mason Valley Fire District	118 S. Main Yerington, NV 89447	Tel 775-463-6535 Fax 775-463-6537	Chief: Steve Tognoli
Careflight	450 Edison Way Reno, NV 89502	Tel 800-648-4888	
HOSPITALS & MEDICAL CENTERS			
South Lyon Medical Center	Whitacre and Surprise Yerington, NV 89447	Tel 775-463-2301 fax 775-463-4300	Kim Billmeyer
Yerington Paiute Tribe Medical Center	170 Campbell Lane Yerington, NV 89447	Tel 775-463-3335	
Northern Nevada Medical Center	2375 E. Prater Way Sparks, NV	Tel 800-874-5775	
UTILITIES			
Telephone- Nevada Bell and others	Repair/Service hotline	Tel 775-333-4611	
Gas- Southwest Gas	Repair/Service hotline	Tel 775-882-2126	
Gas- Paiute Pipeline	400 Eagle Station Ln. Yerington, NV 89447	Tel 775-882-0148	
Water			
Electric- Sierra Pacific	Repair/Service hotline	Tel 800-962-4169	
GOVERNMENTAL AGENCIES			
Lyon County Managers Office	27 S. Main Street Yerington, NV 89447	Tel 775-463-6531 Fax 775-463-6533	Manager: Stephen Snyder
Yerington Mayor's Office	102 S. Main Street Yerington, NV 89447	Tel (775) 463-3511	
Yerington City Managers Office	102 S. Main Street Yerington, NV 89447	Tel (775) 463-3511	Manager: Dan Newell
Nevada State Health Dept. / Community Health	26 Nevin Way Yerington, NV 89447	Tel (775) 463-6539 Fax (775) 463-6534	Jana Patterson
Federal Emergency Management Agency (FEMA) *		Tel (800) 462-9029	

*Contact FEMA when large-scale natural or manmade disasters occur (e.g., earthquakes, floods, forest fires, terrorist attack, etc)

ATLANTIC RICHFIELD COMPANY

Dave McCarthy Day 406-563-5211 ext 430 Cell 406-691-2721

Lorri Birkenbuel Day 406-563-5211 ext 410 Evening 406-691-2200 or 406-494-4215

BROWN AND CALDWELL

Chuck Zimmerman, Project Manager
BC Carson City, NV Day 775-883-4118 Evening 775-882-6931

Brian Bass, BC Field Manager/Primary Site Health & Safety Coordinator
BC Carson City, NV Day 775-883-4118 Evening 775-853-2752

Dean Wall, Corporate Health & Safety Manager
BC Walnut Creek, CA Day 925-210-2469

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SECTION 1.0

GENERAL SITE AND SAFETY INFORMATION

The health and safety (H&S) requirements for Brown and Caldwell (BC) and Brown and Caldwell subcontractor personnel working at the Yerington Mine Site (the Site) are presented in this Site Health and Safety Plan (SHSP). Primary activities at the Site will include earth moving and grading, collection of samples for air, ground water, surface water, and solid materials (e.g., soil), and structure demolition. Because of the anticipated length of time involved with closure operations (greater than one year), some revision of this SHSP is expected to occur during the period of closure operations (i.e., it may be necessary to implement additional H&S requirements and protocols). These revisions would be included as written addenda to this SHSP.

1.1 Introduction

This SHSP provides site and task-specific information unique to activities at the Site. The SHSP provides a description of the required tasks, identifies the potential physical and chemical hazards that may be encountered, and specifies the H&S control measures to be followed throughout the course of the operations. The SHSP also identifies the H&S supervisory personnel and their responsibilities, training and medical surveillance requirements, personal protective equipment (PPE) and control measures, monitoring plan, site control, decontamination protocols, and emergency response procedures.

The following reference sources were reviewed during the development of the SHSP:

- OSHA 29 CFR 1910.120
- Federal Mine Safety & Health Act of 1977, (Public Law 91-173, as amended by 95-164)
- EPA 40 CFR 311
- EPA Standard Operating Safety Guides
- NIOSH Guide to Hazardous Chemicals
- Scope of Work for Closure of the Yerington Mine Site, Lyon County, Nevada
- BP's Golden Rules of Safety
- BP's "Getting HSE Right"
- Atlantic Richfield Company "Contractors Expectations" February 20, 2002

Unless noted otherwise, Health and Safety regulatory guidance for activities conducted at the Site shall conform to standards set by the Mine Safety and Health Administration (MSHA) under the Federal Mine Safety and Health Act (Mine Act). Where the Mine Act does not apply, Health and Safety regulatory guidance shall conform to the appropriate sections of the Occupational Safety and Health Administration (OSHA) 29 CFR 1910. An interagency agreement between MSHA and OSHA in March 1979 gives specific examples of areas of authority for each agency:

MSHA Authority
- Underground, Open Pit, Quarry, Solution, Coal, and Mineral Mining Operations
- Dredging
- Ponds
- Auger Mining
- All Milling Operations (e.g., crushing, grinding, sizing, retorting, leaching, concentrating, washing, and drying operations)

OSHA Authority
- Gypsum board, brick, ceramic, clay pipe, asphalt, and refractory plants
- Smelting (commences at the point when milling, as defined, is completed)
- Electrowinning (commences at the point when milling, as defined, is completed)
- Salt and cement distribution terminals not located on mine property
- Refining (commences at the point when milling, as defined, is completed

The SHSP was prepared based partially on information gathered by other contractors during previous operations at the Site. The information helped to identify potential chemical and physical hazards and to establish the controls and level of protection required to reduce the risks of exposure to these hazards. However, the SHSP could be subject to revision as conditions change or new information becomes available. Revisions can be initiated by field team members, the H&S Coordinators, or the Project Manager, but all significant changes are subject to the approval of BC and Atlantic Richfield Company Health and Safety Managers (HSMs). The SHSP will be kept on-site in plain view in the site office/trailer at all times during the project. The SHSP must be read and signed by all personnel prior to entering the site.

1.2 Site Description

The Yerington Mine site is located approximately one mile west of the town of Yerington in Lyon County, Nevada. A site plan is provided as Figure 1. Beneficiation operations were conducted between 1953 and 1978 for oxide and sulfide copper ores extracted from the open-pit mine in the southern portion of the mine site. Waste rock and tailings areas exist to the north of the open pit. Waste rock areas exist to the south and north of the open pit. Evaporation ponds were also constructed at the site.

In 1989, Arimetco International expanded leaching operations in the southern, central and western portions of the site, which included the construction and operation of an electrowinning plant located near the mill area. Leach pads and solution ponds were also constructed in the oxide tailings areas and cover all but the extreme northern end of the former unlined "finger" evaporation ponds.

1.3 Personnel and Basic Site Safety Requirements

The following primary Atlantic Richfield Company, NDEP, and BC personnel will be involved with the closure activities:

- Dave McCarthy – Atlantic Richfield Company Project Manager;
- Lorri Birkenbuel – Atlantic Richfield Company Safety Representative;
- Art Gravenstein – NDEP Project Manager and Safety Officer;
- Chuck Zimmerman - BC Project Manager;
- Brian Bass – BC Field Manager and Primary Site Health & Safety Coordinator;
- Chad Leonard – BC Field Geologist

Phone numbers for these personnel and Emergency numbers are listed at the beginning of the SHSP (pages i and ii).

Any changes or updates to this SHSP must be approved by the Atlantic Richfield Safety Representative. Copies of the SHSP will be maintained in the project field trailer located at the Site, in the Atlantic Richfield Company Anaconda, MT office, and in the BC Carson City, NV office.

All field personnel must be MSHA-trained in accordance with the Federal Mine Safety and Health Act (Mine Act), Sections 115 and 302. Additionally, depending on the area of the site in which the work is taking place and the nature of the work, personnel may also be required to be Occupational Safety and Health Administration (OSHA) 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) trained in accordance with 29 CFR 1910.120(e). Copies of the annual refresher certificates will be kept in the Health and Safety file at the project field trailer.

All personnel will be required to have a site briefing prior to their first entry onto the site. The site briefing will include reviewing this SHSP and any relevant Job Safety Analysis sheets (JSAs) developed for the Site (included in Appendix E). JSAs shall be created for each individual task, and signed by all personnel involved with the specific task. Signed JSAs shall be kept in Appendix E. Site-specific training will be covered with an initial site tour and review of site conditions and hazards. Elements to be covered in the site briefing include:

- Persons responsible for site-safety;
- Site-specific safety and health hazards;
- Use of personal protective equipment (PPE);
- Safe work practices;
- Engineering controls;
- Decontamination procedures; and
- Emergency response.

This briefing will be conducted by the Site Health and Safety Coordinator or Project Manager. Documentation will consist of date, time, location and names of personnel in attendance, and a

brief synopsis of topics discussed. Records of pre-entry briefings will be kept in the Health and Safety File in the field project trailer.

Subcontractors shall work under the requirements of BC's SHSP. The BC SHSP shall supercede any subcontractor Health and Safety Plans where conflicts in language arise.

Safety meetings will be conducted with workers, at minimum on a weekly basis, to keep personnel apprised of changes to the plan, as well as changes in site conditions or operations that may impact safety and health hazards. Additional safety meetings will be conducted, as appropriate, especially during the first two weeks and during specific activities. Documentation of safety meetings will be kept on file in Appendix D of the SHSP maintained in the project field trailer.

1.4 Emergency Response

In the event of an emergency, call 911 for emergency assistance immediately. The Lyon County Sheriff will identify and contact the appropriate responders based upon the nature and severity of the emergency situation. Medical emergencies will be referred to the Mason Valley Fire Department, who will also identify and contact the appropriate responders based upon the nature and severity of the injuries. Atlantic Richfield Company and Brown and Caldwell staff should also be notified as quickly as possible.

Table 1 is a comprehensive list of additional emergency response phone numbers and **Figure 3A and Figure 3B show the route to the nearest medical facility, South Lyon Medical Center**. Directions to medical facility are described below. Brian Bass is the designated site emergency coordinator and has final authority for first response to on-site emergency situations. In the event that Brian Bass is not on site, Chad Leonard or the senior on-site person will be designated the site emergency coordinator with all applicable authority.

All accidents, including injuries, incidents, and near misses must be reported to BC and Atlantic Richfield Company. The incident must be reported as soon as practical (no longer than an 8-hour shift) to the BC and Atlantic Richfield Company health & safety personnel. Copies of the incident reports must be provided to BC and Atlantic Richfield Company.

Upon arrival of the appropriate emergency response personnel, the site emergency coordinator shall defer all authority but shall remain on the scene if necessary to provide any and all possible assistance. At the earliest opportunity, the site health & safety coordinator or the site emergency coordinator shall contact the BC and Atlantic Richfield Company Project Managers or Health and Safety Officers. Contact information is listed in Table 1.

1.4.1 Primary Emergency Response Phone Number

ALL EMERGENCY RESPONSE CALLS SHOULD BE BY CALLING 911.

Refer to Table 1 for a complete list of emergency telephone numbers.

1.4.2 Directions to Nearest Medical Facilities

Refer to Figures 3A and 3B for the location of the medical facility relative to the project site.

Route to South Lyon Medical Center
Depart the mine site using the main entrance road (named Burch Drive on the map, Figure 3A) heading east. Turn right (south) on Highway 95 and continue 0.1 miles to left turn for continuing on Highway 95. Turn left on to Highway 95 (aka Goldfield Avenue). Continue east on Highway 95 approximately 0.4 miles to Main Street. Turn right (south) on Main Street. Continue south on Main Street approximately 0.3 miles to Surprise Street. Turn right (west) on Surprise. Continue (three blocks) to Hospital at corner of Surprise and Whitacre.

Refer to Section 7.0 for more information on emergency response procedures.

1.5 Job Safety Analyses

A Job Safety Analysis (JSA) is a hazard identification technique that involves breaking a job down into basic work elements. Each work element is then evaluated to identify possible conditions or activities that could lead to an accident. Finally, control measures are recommended to minimize illness and injury at the work site. JSAs will be prepared for all activities to be conducted at the Site, and reviewed with all personnel prior to commencement of job activities.

A JSA is a procedure used to review job methods and uncover hazards that: 1) may have been overlooked in the layout of the plant or building and in the design of the machinery, equipment, tools, work stations, and processes; 2) may have developed after production started; or 3) resulted from changes in work procedures or personnel.

A JSA is an important accident prevention tool that finds and eliminates or minimizes hazards before the job or task is performed. Since employees and supervisors know the jobs the best, it is important that they provide their knowledge and experience about safety and health as they relate to the task or job being analyzed. Some other benefits of a JSA are:

- Train new employees on jobs they will be performing, or provide refresher training;
- Study jobs for possible improvements in methods or steps, or when they are added or removed;
- Use as a refresher for jobs that are non-routine or performed infrequently;
- Use as an accident investigation tool; and
- Most importantly, use as a tool to inform employees of specific job hazards and protective measures to avoid accidents or injuries.

The four basic steps in making a job safety analysis are:

1. Select the job to be analyzed;
2. Break the job down into successive steps or activities and observe how these actions are performed;
3. Identify the hazards and potential accidents; and
4. Develop safe job procedures to eliminate the hazards and prevent the potential accidents.

Job Safety Analyses for the project will be developed as various tasks are defined over time. Each job safety analysis will be developed jointly by the BC Health & Safety personnel and the subcontractor personnel that will be involved in the task, and each will be reviewed by the Atlantic Richfield Company Health & Safety Representative prior to initiation of the job. Job Safety Analyses will be included in Appendix E as they are developed. The on-site personnel involved in each job will review and sign each JSA prior to initiation of each job.

SECTION 2.0

TRAINING REQUIREMENTS

All Brown and Caldwell staff and subcontractors performing environmental work (that is not considered a mining activity) under the following conditions shall be required to have the certified training and guidance indicated:

Active mine sites (where mining operations are taking place).

- OSHA or MSHA certified training- current. Mine operators may specifically require either or both of these certifications.
- Familiarity with the requirements of this SHSP and participation in site activity and safety briefings.

Inactive mine sites or non-mining sites where no known potential for hazards exists.

- Familiarity with the requirements of this SHSP and participation in site activity and safety briefings.

Potential Hazards, Known Hazards, or Hazardous Materials Present (active or inactive sites).

- OSHA HAZWOPER certified training - current
- Familiarity with the requirements of this SHSP and participation in site activity and safety briefings.

Hazard recognition and basic health and safety issues are covered under the Occupational Safety and Health Act of 1970 (OSHA Act) and the Federal Mine Safety and Health Act of 1977 (MSHA Mine Act) and the Interagency Agreement Between MSHA and OSHA of 1979. Where operations involve any potential or real hazard or hazardous waste, occupational safety and health regulations contained in 29 CFR 1910.120(e) shall also be complied with, and certification under the Hazardous Waste Operations and Emergency Response (HAZWOPER) program shall be required.

Site-specific training for the field teams will be conducted by the Field Managers, the H&S Coordinators, or a fully qualified designee. The training, at a minimum, is to include a review of the SHSP, individual task descriptions and responsibilities, task hazards, and other H&S-related issues, hazards, and requirements unique to the Site and treatment system operations. In addition, field personnel are to review the SHSP and complete the appropriate check lists and forms included in Appendix B. All site training will be documented and the documentation will be maintained in Appendix D of this plan.

SECTION 3.0

HAZARD ASSESSMENT

The H&S hazards that may be encountered by personnel during the course of the project are addressed in the following paragraphs.

3.1 Materials Stored, Handled, or Generated at the Mine Site

Materials that will or may be stored, used, and/or generated at the site include, but are not limited to:

- Diesel or gasoline fuel; lubricating oils or solvents
- Sludge or fugitive dust containing potentially elevated concentrations of metals
- Pond processing solutions
- Lime, sodium hydroxide, or other chemicals used in water treatment processes.
- Cleaning solvents
- PCV glues and primers

Material safety data sheets (MSDSs) for all materials stored or used at the Site and International Chemical Safety Cards for constituents of some mining process media are included as Appendix A of this SHSP. A copy of the SHSP will be maintained in the field trailer. The addition of any new substance(s) shall require the inclusion of an MSDS for that substance prior to introduction of that substance to the Site.

3.2 Potential Chemical Hazards

The sources to which personnel may potentially be exposed to harmful chemicals consist primarily of:

- Acid mine drainage (AMD)
- Soil/sludge contaminants
- Process pond solutions
- Hydrocarbon fuels (e.g., diesel or gasoline)

Personnel should avoid exposure to AMD, soil contaminants, and process pond solutions through use of rubber gloves, rubber boots, or other PPE as appropriate.

Material Safety Data Sheets (MSDSs) will be maintained at the Site for each chemical used in the process and must be reviewed by all personnel who use or may come into contact with the chemical. MSDSs are included as Appendix A to this SHSP.

Personnel could be exposed to soil contaminants through excavation or earth-moving activities, direct contact with the sludge during dewatering, and disposal activities. Until or unless the soil or sludge is fully characterized, personnel should implement at minimum Level B protective measures. Chemical-resistant clothing (Saranex-coated Tyvek or rubber apron), rubber or PVC safety boots, and rubber gloves should be used as appropriate to minimize physical contact with the sludge. An air-purifying respirator (APR) should be used if any dust or particulate matter is generated. PPE is discussed further in Section 4.0.

The following paragraphs provide a brief discussion of the chemicals present in typical AMD, tailings, or process solutions that may pose a potential exposure hazard to personnel. Additional information on these chemicals and other substances and their potential health hazards is provided in the MSDSs and the International Chemical Safety Cards included as Appendix A. The MSDS should also be consulted for additional information on fire hazards, appropriate spill response procedures, chemical properties, as well as handling, storage, and other special precautions to be implemented. The federal MSHA and OSHA enforceable permissible exposure limits (PELs) are also presented for the chemicals known or suspected to be present at the Site. Exposure to these chemicals in excess of the PELs is expressly prohibited without appropriate respiratory protection. Although inhalation exposure exceeding PELs is not anticipated, field personnel should be aware of the common symptoms of exposure to airborne particulates or corrosive vapors, including coughing, respiratory distress, irritation of the eyes, nose, or throat, nausea, dizziness, drowsiness, and/or headache. If respirators are deemed to be required, issuance, fitting, and testing will be in accordance with a respiratory protection plan.

3.2.1 Acid Mine Drainage

Typical AMD from underground mine sources or stored in process ponds may contain a number of inorganic contaminants, and is variably corrosive. The individual inorganic contaminants dissolved in AMD (e.g., arsenic, cadmium, copper, manganese, nickel, and zinc) are not volatile and do not pose an inhalation hazard. The chemical hazards associated with some of these AMD inorganics are discussed individually in the following paragraphs. The pH of AMD may be as low as less than 2.0 standard pH units. At pH levels below 2, dermal contact may cause skin irritation, at levels below 3.5 eye contact could cause injury, but would surely result in severe eye irritation. Consequently, any direct contact with AMD must be avoided through the use of appropriate PPE (e.g., face-shields or goggles, rubber gloves, rubber apron and oversleeves or chemical-resistant Tyvek coveralls, long sleeve shirts, etc.). At pH 4.5 to 9.0 the water is much less corrosive but dermal absorption of the metals in the water should be prevented through use of rubber gloves, rubber boots, and other protective clothing, as appropriate.

3.2.2 Lime

Lime may be used in AMD treatment processes, or other process to treat acidic solutions. Lime (calcium hydroxide) is a white to gray powder. It has an ammonia odor, and a bitter alkaline

taste. Dermal exposure to dry lime will not affect the skin immediately on contact, but, if not immediately washed off, will result in skin irritation and, possibly, burns or blistering. Eye contact can cause painful eye irritation and, if not immediately flushed, can cause edema (i.e., fluid buildup) of the conjuctiva (protective outer membrane of the eyelid and eyeball) and cornea. The ultimate result of a caustic burn may be a scar on the cornea, or iritis (irritation of the iris). Glaucoma may be a complication of iritis, if the chemical penetrates the anterior chamber of the eye. Caustic burns are always of concern because they continue to soak into tissue as long as they are allowed to remain. Consequently, an eye may not look too bad the first day after an exposure, but it can deteriorate significantly. Exposure to airborne particulates or aerosols can cause irritation of the eyes and respiratory tract and result in respiratory discomfort, coughing, nausea, and vomiting. Ingestion, the least likely exposure route, may cause burning in the mouth, throat, and esophagus, and result in abdominal and chest discomfort, nausea, vomiting, diarrhea, weakness, drowsiness, and, possibly, coma. If lime is used in any water treatment processes, personnel will observe extreme caution when working the chemical. Use chemical-resistant clothing to cover all exposed parts of the body, including goggles, splash shield, gloves, dust mask, oversleeves, and rubber apron or Tyvek coveralls. The OSHA PEL for calcium hydroxide is 5 mg/m^3.

Various inorganics have been detected in AMD, soils, and sludges in process areas of some mining operations. The following is a partial list of inorganics that could potentially be encountered in soil, sludge, or water at the Site. The list includes a brief description of health hazards, routes of entry, target organs, symptoms, and some exposure limits.

3.2.3 Arsenic

Arsenic is a poison and cancer hazard. Acute inhalation of inorganic arsenic can damage mucous membranes and can result in pharyngitis, laryngitis and even nasal septum perforation. Chronic inhalation exposures can cause inflammation of the membranes lining the nasal passages, trachea, and larynx. Dermal contact can cause skin irritation and dermatitis. General symptoms of chronic arsenic poisoning are skin disorders (hyperpigmentation, hyperkeartosis), weakness, lassitude, loss of appetite, loss of hair, hoarseness, and mental disorders. The primary target organs are the skin, nervous system (e.g., peripheral nerve dysfunction), and vascular system (e.g., leukopenia, a serious reduction in white blood cells). Water-soluble inorganic arsenic compounds are absorbed through the gastrointestinal tract and lungs. Arsenic is classified as a USEPA weight-of-evidence Group A, or known human carcinogen, based on studies that have shown a clear correlation between exposure to arsenic and lung cancer. The OSHA PEL for arsenic is 0.010 mg/m^3.

3.2.4 Cadmium

Cadmium is a probable human carcinogen and acute inhalation exposure may result in headache, chest pains, muscular weakness, and pulmonary edema. Acute oral exposure can cause gastrointestinal irritation, vomiting, abdominal pain, and diarrhea. Longer term exposure affects the kidneys and, possibly, the skeletal system. Based on occupational epidemiologic studies and animal data for respiratory tract cancer, cadmium is a probable human carcinogen (USEPA weight-of-evidence Group B1). The OSHA PEL for cadmium is 0.005 mg/m^3.

3.2.5 Copper

Copper has been detected in AMD samples collected from the ponds at concentrations ranging from 5.0 to 27.6 mg/l, and is not expected to be present in the sludge at concentrations that would pose a potential health hazard (i.e., >2,000 mg/kg). Ingestion of elevated levels of copper through oral, inhalation, or dermal exposure can cause gastrointestinal disturbance, hepatic, and renal effects. Copper is classifiable as to human carcinogenicity (USEPA weight-of-evidence Group D). The OSHA PEL for copper is 1 mg/m^3.

3.2.6 Manganese

Exposure through ingestion or inhalation of elevated concentrations of manganese can cause headache, insomnia, disorientation, anxiety, lethargy, and memory loss. An increased incidence of coughs, colds, bronchitis and other respiratory problems have also been seen as a result of respiratory exposure. Manganese is not classifiable as to human carcinogenicity (USEPA Group D). The OSHA PEL for manganese is 5 mg/m^3.

3.2.7 Nickel

Soluble nickel compounds tend to be more toxic than the insoluble compounds with the primary target organs including lungs and upper respiratory tract for inhalation exposure and the kidneys for oral exposure. Inhalation exposure to some nickel compounds can also be toxic to the immune system. Acute inhalation exposure may produce headaches, nausea, and respiratory disorders. Dermal contact with nickel or nickel-containing materials may result in contact dermatitis. The OSHA PEL for nickel metal or insoluble nickel compounds is 1 mg/m^3.

3.2.8 Zinc

Although acutely toxic oral doses can cause nausea, vomiting, diarrhea, and abdominal cramps, there appear to be no clearly defined toxic effects resulting from low level inhalation exposures. Zinc is not classifiable as to human carcinogenicity (Group D). The OSHA PEL for zinc, as zinc oxide dust or respirable particulates not otherwise regulated, is 5 mg/m^3.

3.2.9 Process Pond Solutions

Process ponds may contain a number of organic or inorganic substances, some of which may be toxic and/or corrosive. The individual inorganic contaminants dissolved in process pond solutions (e.g., arsenic, cadmium, copper, manganese, nickel, and zinc) are not volatile and do not pose an inhalation hazard. The chemical hazards associated with some of these inorganics are discussed individually in the preceding paragraphs. The pH of process pond solutions may vary depending on the purpose of the pond in the processing chain. At pH levels below 2, dermal contact may cause skin irritation, at levels below 3.5 eye contact could cause injury, but would surely result in severe eye irritation. Consequently, any direct contact with pond solutions must be avoided through the use of appropriate PPE (e.g., face-shields or goggles, rubber gloves, rubber apron and oversleeves or chemical-resistant Tyvek coveralls, long sleeve shirts, etc.). At pH 4.5 to 9.0 the water is much less corrosive but dermal absorption of the metals in the water

should be prevented through use of rubber gloves, rubber boots, and other protective clothing, as appropriate.

3.3 Potential Physical Hazards

Physical hazards that could be present during activities at the Site are addressed in the following paragraphs. Physical hazards, such as slips, trips, and falls and muscle strains are generally the most common source of work place injuries. However, activities at the Site may also expose personnel to hazards associated with temperature extremes (e.g., heat or cold stress), operation of heavy equipment, noise, high altitudes (>7,000 feet above sea level), and biological hazards (e.g., poisonous snakes, insects, plants). If personnel are not cognizant of these hazards, do not implement appropriate safety precautions, and do not follow prescribed safety procedures, there is a greater potential for accidents and personal injury. The Project Manager and Site Health & Safety Coordinator will stress that field personnel follow safe work practices at the Site and will make any changes necessary to improve the safety of operations for all BC and subcontractor personnel

3.3.1 Temperature Extremes

Heat Stress Hazards

Personnel may be susceptible to heat stress during periods of elevated ambient temperatures or humidity, or during the performance of strenuous activities, particularly if impervious personal protective clothing is worn. The field team will observe and monitor one another for early signs of heat stress, whenever ambient temperatures reach or exceed 85 °F; and if impervious clothing (e.g., Saranex-coated Tyvek coveralls) is worn, personnel will be monitored whenever temperatures exceed 70 °F. An ear probe or oral digital thermometer will be included in the first aid kit maintained at the Site to measure oral temperatures.

Personnel whose oral temperatures exceed 100 °F will not be permitted to continue working until their temperature returns to a normal range (96.8 °F to <99.6 °F). Drinking water and electrolyte beverages will be available at the Site and personnel will be encouraged to drink sufficient fluids to prevent salt loss and dehydration. In hot conditions, at a minimum, personnel should break every two hours for 10 to 15 minutes. Personnel should be cognizant of the early signs of heat stress and the necessary treatment procedures as summarized below.

Heat Cramps

Symptoms: Muscle spasms or cramps, particularly in the legs and abdomen; may also accompany heat exhaustion.

Treatment: Move affected individual to a cool, covered area and provide water or electrolyte beverage (drink one or two glasses); gently massage the affected area; apply firm pressure and place warm, wet towels over the cramped area for relief.

Heat Exhaustion

Symptoms: Elevated body temperature (100 to 104 °F); pale and clammy skin; profuse perspiration; lethargy and fatigue; dizziness, possible headache, nausea, fainting.

Treatment: Move victim to a cool area and provide water every 15 minutes for 3 or 4 doses; remove all chemical protective clothing; lay flat except when drinking, rest and open clothing to allow air circulation; drink plenty of cooled water or electrolyte beverages; the individual is not to return to work, seek medical care in severe cases. It is essential to remember that a transition to the very hazardous heat stroke can be quite rapid.

Heat Stroke

Symptoms: Elevated body temperature (may be as high as 106 °F); skin is red or flushed, dry, and hot to the touch. There may be nausea, dizziness, headache, and pulse may be rapid and strong; possible loss of consciousness, delirium, or coma. These symptoms indicate a potential life-threatening situation; transport to emergency medical facility, or, if cannot be moved, notify emergency medical services. The worker's temperature control system has stopped working correctly. The body temperature could rise so high that brain damage and death could result if the body is not cooled quickly.

Treatment: Move victim to cool shady area, remove all PPE and rapidly attempt to cool victim by sponging the body with isopropyl alcohol or cool water, or pour water on the body; place an ice bag on victim's head. Continue to closely observe the victim. If the temperature starts to rise, cool the victim again. Heat stroke requires medical attention, ensure that the victim is transported to the nearest medical facility.

Whenever possible, laborious tasks should be scheduled during early mornings or evenings to take advantage of the coolest parts of the day. If not feasible, work schedules should be established which provide frequent rest periods.

Cold Stress Hazards

Although extended exposure to very cold temperatures is not anticipated, early morning or late night temperatures near or approaching freezing, high winds and periods of rain and possible snow flurries may be encountered. Cold stress resulting in hypothermia (i.e., when the body core temperature drops below 96.8 °F) and the possibility of frostbite are possible when individuals work for extended periods at ambient temperatures of 30 °F to 40 °F (4 °C) or less. Symptoms could include shivering, pain in the extremities, and drowsiness or disorientation. If any of these symptoms are experienced, the affected personnel should immediately get out of the cold conditions and warm up in the field office or in a vehicle. Adequate insulating clothing should be worn whenever field activities are performed in temperatures below 40 °F.

3.3.2 Heavy Equipment Operation

Only fully trained, qualified or licensed, authorized personnel will be permitted to operate heavy equipment at the work site. Hazards commonly associated with the operation of heavy equipment such as the front-end loaders, cranes, and aerial lifts include:

Fire/Explosion. The equipment is a source of ignition and, therefore a fire safety hazard. Fires can be caused by exhaust sparks, friction sparks, and directly by fires within the engine compartments, batteries, or electrical systems. The use of internal combustion engines will not be permitted in areas containing dry vegetation or potentially flammable materials, or in flammable/explosive atmospheres where they could provide the necessary ignition for an explosion.

Burns. Contact with hot surfaces (exhaust pipes, mufflers, radiators) can result in serious burns. Although generally enclosed or covered, contact with these surfaces should be carefully avoided. Leave safety covers or guards in place. Personnel should always assume that equipment is hot, and not touch the engine, exhaust pipes, mufflers, radiators, radiator caps or hoses unless the equipment has been shut off for several hours or until the engine and surfaces have sufficiently cooled. Check cooling systems through the overflow tank rather than removing the radiator cap.

Hydraulic Fluids and Fuels. Contact with pressurized hydraulic fluids and fuels can cause severe injury to the eyes and skin. Hydraulic fluids and fuels can penetrate the skin and may require immediate medical attention. In the event of a hydraulic system failure or fuel line rupture, the operator is to shut down the equipment immediately and contain the fluid or fuels using the spill cleanup materials available at the Site (e.g., pads, booms, loose sorbent). Hydraulic system repairs and servicing should be left to a mechanic familiar with the piece of equipment.

Ground Personnel Contact. Movement of mobile equipment and motor vehicles, particularly in tight or congested areas, poses a potential safety hazard to field personnel as well as the operator. Whenever ground personnel must work in the vicinity of heavy equipment or multiple small vehicles, ground personnel will wear brightly colored, high visibility safety vests. Heavy equipment should have backup lights and alarms, and appropriate safety equipment (rollover protective structures, emergency shutoff in case of rollover, seat belts, etc.). In addition, the field team member on the ground is to guide the operator when backing up or entering the treatment system work area, when the operator does not have full view of the area, and when the terrain is hazardous. It is essential that the operator is aware of the location of all field personnel whenever equipment is being moved in work areas. Ground personnel working near mobile equipment who are unable to leave the area are to make eye contact with the operator, alert him to their presence, and move cautiously at all times. Operators should lower booms or buckets before ground personnel approach the equipment. The field team will be responsible for controlling access of heavy equipment onto the work site and informing all personnel where and when equipment will be moved.

Roll-Over. Roll-overs are primarily a result of operating mobile equipment, such as the aerial lift, or vehicles on steep slopes, unstable surfaces, such as those which may be encountered at the Site, or when making sharp turns at unsafe speeds. Injuries from roll-overs can be fatal,

particularly when the operator is thrown from the vehicle or equipment. Each operator will carefully survey the route to be traveled checking for overhead obstructions, holes, slopes, ditches or other potential hazards prior to moving the equipment. Seat belts are to be used by all operators. At no time will vehicles or other heavy equipment be operated at speeds that directly disregard existing conditions at the Site or access roads (e.g., weather, traffic, intersections, roadway width, grade). Heavy equipment that is left unattended shall be made immobile by grounding of buckets or by insertion of chock blocks under wheels or tracks.

Field personnel must first be trained and demonstrate their competence to operate heavy equipment and powered equipment and tools (air compressors, generators, motors, pumps, etc.) used during activities. Personnel are reminded to follow the manufacturers instructions, O&M manuals, SOPs, and to follow these basic safety guidelines:

- Inspect the equipment/unit for unsafe conditions each day prior to use. Test controls each day to determine if in safe working order;
- Require that the manufacturer's operating instruction manual be available on site, and controls are plainly marked;
- Turn off appropriate circuit breakers when servicing electrically actuated equipment (motors, mixers, pumps, rotors, valves);
- Do not operate any controls when hands are wet;
- Disconnect air sources prior to servicing any air-operated equipment;
- Never exceed maximum pressure ratings;
- Always wear safety glasses when servicing or operating equipment or power tools; and
- Check electrical cords for broken insulation and potential exposure to water or other liquids.

3.3.3 Noise

Various equipment such as pumps, power generators, and mixers will be generating noise during operations. Consequently, noise levels at the Site may exceed 85 dBA, thereby, constituting a noise hazard and potentially interfering with communication. Operators and ground personnel shall use standard hand signals when noise levels inhibit or prohibit normal auditory communication. A noise level that interferes with normal conversation at a distance of three feet, is a potential noise hazard, requiring hearing protection. Field personnel exposed to excess noise levels will wear earmuffs or earplugs. If the noise reduction is insufficient to adequately attenuate noise levels, then noise absorbers/acoustic screens or other noise-attenuating barriers will be positioned to enclose the noise source.

3.3.4 Slips, Trips, and Falls

Injuries can be prevented by proper control measures, safe work practices, and keeping work areas free of obstructions. At a minimum, weekly safety meetings are to be held by the BC and

subcontractor personnel during construction and initial startup, and on a regular basis, as necessary, during subsequent operations. The meetings will identify specific work areas that are of concern (e.g., unstable structures, slippery surfaces, pipes, steep grades, uneven terrain, etc.) and will specify work practices and controls necessary to avoid or deal with these hazards. Slippery areas of the Site will be identified, and if feasible, appropriately controlled through the placement of safety mats, caution signs, and/or by restricting access to these areas with barricades or tape. Communication between all 2-man teams is essential.

Construction and operations may expose personnel to fall hazards of 4 feet or more. Fall protection/prevention systems will be provided at the work site, if required. Guardrail systems or personal fall arrest systems (full body harness, shock-absorbing lanyard, lifeline, secure anchorage points) will be used when there is a requirement for activities to be conducted at unprotected elevations 6 feet or more above a lower level. Whenever feasible, an aerial lift will be used for personnel to access elevated locations.

3.3.5 Skeleto-Muscular Injuries

Activities may require occasional lifting of heavy objects. No one is to attempt to lift large, heavy, or cumbersome objects without assistance. Appropriate material handling equipment (e.g., drum trucks, hand carts, drum cradles, dollies, etc.) should be available at the Site.

3.3.6 Process or Treatment System Equipment

Ore processing systems and soil or water treatment systems may be operated and controlled manually or automatically by various switches, sensors , and controllers. The Project Engineer and Site Safety Coordinator will ensure that the field personnel are properly trained during initial system startups of treatment systems, or during normal operation of existing systems, and that training is updated as necessary throughout system operations. Project personnel shall take precautions to ensure that all equipment scheduled for demolition or removal is de-energized (no power source) before demolition or removal begins.

The field personnel are reminded to follow the following basic safety guidelines when operating or servicing any treatment equipment or removing old process equipment.

- Turn off appropriate circuit breakers when servicing electrically actuated equipment (motors, mixers, pumps, valves);
- Assure that all pinch points in moving machinery are guarded. If there is a question about adequate guarding, contact the manufacturer or the BC H&S Staff;
- Never remove a machine guard from equipment unless the equipment is adequately locked and tagged out;
- Do not operate any controls when hands are wet;
- Disconnect air sources prior to servicing any air-operated equipment;
- Never exceed maximum pressure ratings;

- Turn off mixers or agitators when adjusting shaft pitch; after adjustment, manually rotate shafts to verify props do not contact polymer tank or clarifier walls;
- Do not operate mixers/agitators when props are not sufficiently submerged, or when the clarifier or tank is empty;
- Always wear safety glasses when servicing or operating equipment or power tools; and
- Check electrical cords for broken insulation and potential exposure to water or other liquids.

3.3.7 Confined Spaces

Entry into any confined space is strictly prohibited unless a Work Permit for Confined Space Operations, in accordance with MSHA and/or OSHA (29 CFR 1910.146; 8 CCR 5156 et seq), as appropriate, is obtained and the permit requirements are met. The permit will be prepared by the senior on-site field team member and approved by the BC H&S Coordinator prior to any entry into a confined space. A confined space for the purposes of this SHSP includes: pipelines, storage tanks, pits, tunnels, excavations, and any spaces or enclosures that have limited ventilation and openings for entry or egress, or are not meant for human occupancy. The primary confined spaces of concern at this project include excavations which could collapse or vessels that could possess oxygen deficient atmospheres and which could contain components with the potential to discharge energy or fluid into the confined space.

If a confined space entry is required to achieve project goals, refer to Brown and Caldwell's Corporate Health and Safety Manual for details on Confined Space Entry permits and procedures. A copy of Brown and Caldwell's Health and Safety Manual will be available at the project site.

3.3.8 Electrical Equipment

Power will be supplied to work areas from either existing utility-supplied grid power, or from a generator. Power-operated equipment includes the field trailer, exterior lighting, ancillary equipment, hand tools, etc.

All electrical systems (wiring and equipment) will be a type listed by a nationally recognized testing laboratory suitable for installation and use at the Site, and installed in accordance with applicable state and federal regulations (29 CFR 1910 Subpart S; 8 CCR Div. 1, Subchapter 5, Electrical Safety Orders); National Electrical Safety Code (NESC), and National Electrical Code (NEC) standards; and manufacturer's instructions. Whenever feasible, low-voltage equipment with ground-fault interrupters and water-tight corrosion-resistant connecting cables will be used. All electrical circuits will be grounded in accordance with NEC and NESC standards.

Sufficient access and working space (no less than three feet) will be provided about all live parts of electrical equipment. Live parts of electric equipment 50V or more will be guarded against accidental contact by limiting access or by partitioning or screening. An emergency shut-off for

all powered units should be provided in a readily accessible location at the control cabinet and clearly labeled or marked.

Personnel must be aware of potential hazards due to unexpected start-up (energizing) of equipment, or the release of stored energy or material that could injure personnel working on or near powered equipment or machinery. The Field Managers and field personnel will determine if machinery or equipment pose a potential hazard and should be locked or tagged out during maintenance activities. Lockout/tagout procedures are discussed further in Subsection 4.1.1.

3.3.9 Adverse Weather

The BC and subcontractor personnel will be responsible for determining if field activities can be continued in a safe manner. High winds, heavy precipitation (rain or snow), electrical storms, and visibility-impairing conditions could make construction and operation of the treatment facility difficult. If the team determines that conditions pose a potential safety hazard, they will advise the Project Engineer and subcontractor supervisory personnel that further outdoor activities will be terminated until conditions improve. Certain activities can be conducted during moderately inclement weather (e.g., light to moderate rain or snow), but personnel should be alert to an increased likelihood of slip-trip-fall injuries and should limit non-essential activities accordingly, particularly when fall hazards are present (i.e., working at heights in excess of four feet above ground level).

3.3.10 High Altitude Illness

There are potential risks associated with working at high altitudes. Although high altitudes are generally defined as 8,000 to 14,000 feet, Acute Mountain Sickness (AMS) can occur at altitudes as low as 7,000 feet but generally effects most people at altitudes above 10,000 feet.

Personnel on this project will be working at an altitude of approximately 5,000 feet above mean sea level. Problems associated with high altitude are not anticipated at this project site.

3.3.11 Lighting

Operation of the system may require that personnel be present at the Site at times when natural illumination is inadequate. MSHA requires that suitable portable lights must be provided to secure the safety of employees when adequate natural illumination or permanent artificial illumination cannot be made available. Insufficient light causes accidents and reduces work performance. Workers need adequate lighting to see hazards at the work site and to read information on instruments and dials.

Portable outdoor tripod floodlights and/or general purpose work lights will be used at the Site to ensure proper illumination whenever activities are conducted after dark. Where appropriate, work lights should meet the MSHA and IES/ANSI RP-7-1991 minimum illumination level of 5.0 foot-candles.

3.4 Potential Biological Hazards

Of potential concern are poisonous spiders and snakes, poisonous/irritating plants (poison oak, poison ivy), and stinging insects, particularly those to which individuals may have developed allergies (i.e., bees, wasps). Individuals with allergies to insect stings (bees, wasps, etc.) should notify the Site H&S Coordinator and other supervisory personnel. Tailgate safety briefings should identify potential locations of poisonous plants and dense foliage where insects or snakes may be hidden. A first aid kit will be available to treat minor insect bites and stings. Adherence to safe work practices such as not reaching into dark places or picking up rocks and other objects, inspecting clothing and exposed skin for presence of ticks periodically during the day, and wearing steel-toed safety boots, long-sleeve shirts, and heavy leather work gloves when removing or contacting vegetation.

3.4.1 Poisonous Plants

Poison ivy and poison oak can result in rashes and blisters within a couple of hours or days after contact. The irritation comes from the plant resin and through itching and scratching can be carried from the original point of contact to other areas of the body. Following contact, it is best to remove one's clothing and wash the skin with copious changes of soap and water, being careful no to rupture any blister that may have formed. For mild cases application of a simple soothing lotion (calamine should be in the first aid kit) should be enough; but in severe exposures there may be a raised body temperature indicating the need for medical attention.

3.4.2 Spiders and Other Insects

Although most spiders are harmless, there are two species that pose a potential hazard: the brown recluse or violin spider *(Lox osceles reclusa)*, and the black widow *(Latrodectus mactans)*. Spider bites, although rarely fatal, are often quite painful. Symptoms may include severe pain in the area of the bite, profuse sweating, nausea, abdominal cramps, and difficulty breathing and speaking. Field personnel are reminded to exercise extreme caution when working in dark, damp, covered areas since spiders are typically found in these locations.

First aid procedures for minor insect bites and stings include: cold applications, use of soothing lotions (e.g., calamine), and for a bee sting, removal of the venom, stinger, and venom sac. If the bite or sting is from a poisonous spider or produces a severe reaction, implement the following procedures: calm and keep the victim from moving about, preferably in a prone position and immediately transport to the nearest medical emergency facility. If the victim cannot be transported to a hospital and emergency assistance is not immediately available, the field team should remove the venom sac with the Sawyer extractor, immobilizing the bitten extremity and keeping it below the heart, and, if necessary, provide artificial respiration and CPR. However, it is essential to get the victim to a hospital immediately.

If a tick is attached to the skin, gently pull it out with tweezers, being careful not to squeeze the tick's body, clean the bitten area with antiseptic and watch for any rash. If possible save the tick in a bottle for later identification. Certain ticks *(ixodes* spp.) commonly found on deer, but also on dogs and mice, are vectors (carriers/transmitters) of the bacterium *Borrelia burgdorferi*, the

cause of Lyme disease. The tick must feed for approximately 48 hours for the bacterium to be transmitted, and even then the risk of infection is only 4 percent in individuals bitten by an infected tick. Nevertheless, since Lyme disease in rare cases causes transient heart problems, chronic arthritis, and nervous system disorders, check for ticks, especially on hairy parts of the body following activities in high grass and brush. If bitten by a tick, watch for the characteristic rash within five weeks of the bite (ring of redness surrounding a central pale area) which is often accompanied by flu-like symptoms and pain in the muscles and joints, especially the knees.

3.4.3 Snakes

Snake bites are serious and should be treated as though from a venomous snake, such as a rattlesnake (triangular head, thick body, pits between the eyes and nostrils, generally 4 to 6 feet long, blotched brownish, gray or red coloration, characteristic rattles). Seek medical attention immediately, transport the victim to the nearest medical facility (see Table 1 for telephone numbers and Figure 3A and 3B for directions). Signs and symptoms of venomous poisoning include swelling, pain, and tingling at the bite site, tingling and a metallic taste in the mouth, fever, chills, blurred vision, and muscle tremors. Even if the bite is not from a venomous snake there is a real possibility of tetanus. The following first aid steps should be followed while transporting the individual to the emergency room or waiting for medical assistance, if the victim cannot be moved:

- Calm the victim and keep hydrated and comfortable;
- Immobilize the affected area and keep at or below the level of the heart;
- Remove rings, watches, and other constrictive items before swelling starts; and
- Gently clean the wound with an antiseptic soap and apply sterile dressing, don't apply ice or attempt to cut the bite site and suck out the venom.

The immediate goal should be safe and rapid transport to the emergency room without undue anxiety or activity that may accelerate absorption of the venom. A short walk is acceptable if the patient feels up to it and if no other alternative is available. A suction device, such as a Sawyer Extractor, can be used to effectively remove up to 30 percent of the venom if applied within three minutes of the bite. An Extractor, which is applied without incision, should be maintained in the first aid kit and used when indicated and certainly when there may be a delay in getting emergency medical treatment.

Personnel should remember that snake bites are preventable events. Most individuals that are bitten see the snake, but then take actions that put them at risk. Give snakes a wide berth, move away and the snake will not chase you. Always look before you step over an object, and before you turn over a rock or log, or place your hand in a crevice. Complete outdoor tasks during daylight hours. Personnel should always wear protective clothing (heavy leather work gloves, thick leather safety boots, long-sleeve shirts) when working in areas with tall grass or potential snake habitat.

3.4.4 Other Wild and Domestic Animals

Other animal hazards that could be encountered include wild and domestic animals, primarily dogs. Most wild animals will be frightened away, but the more domestic they are, the less likely they will run. Beware of skunks and porcupines that do not flee or raise their tails vertically, you could become a target for noxious excretions or quills. The following guidelines are recommended to avoid animal attacks in the field:

- Surprising animals and thereby provoking an attack can be avoided by making noise when entering wooded or covered areas.
- Make a wide detour around all animals that are observed.
- If animals are present at the Site that pose a potential threat and cannot be scared away, return to the field trailer and notify the local animal control agency, or forest ranger.

Watch out for rodent nests; rodent infestations could pose a potential health hazard (rodents may carry hantaviruses, the causative agent of hemorrhagic fever); inhalation or ingestion of urine, feces or saliva, even aerosols, from infected rodents could transmit the virus to workers.

Bats could also be encountered. They are essentially harmless; less than l percent are infected with rabies, and attacks are rare. Nevertheless, of the 25 cases of human rabies diagnosed over the past 18 years in the USA, 22 were linked to bats. If there is an incident were someone may have been scratched, bitten, or even touched by a bat, wash the area with soap and water and get medical advice immediately. Anti-rabies treatment may be necessary. If it is necessary to capture a bat to have it tested for rabies, wear heavy gloves and trap the bat in a large can or cardboard box, or call the local animal-control agency, or forest ranger.

SECTION 4.0

PERSONAL PROTECTIVE EQUIPMENT AND CONTROLS

This section identifies the appropriate PPE, engineering and administrative control measures, and monitoring/sampling procedures to be employed at the Site to limit the risk of exposure to potential hazards. As additional information becomes available identifying new or previously unknown Site or task-specific hazards requiring variations or modifications to these requirements or additional PPE/controls, the SHSP will be modified accordingly.

4.1 Engineering and Administrative Control Measures

The BC field team and subcontractor personnel will be reminded during safety briefings to be aware of potential chemical and physical hazards and to immediately inform the other on-site personnel of any unsafe conditions or new hazards they may encounter. Each field team is responsible for ensuring that site control measures are implemented (e.g., marking, warning signs, placards, erecting barriers, securing, and controlling access) and informing Site personnel of specific work site hazards.

All hazardous materials will be stored in a chemical storage cabinet located in a secured area of the Site accessible only to authorized personnel. The cabinets will have sufficient spill containment and appropriate Department of Transportation (DOT), National Fire Protection Association (NFPA) or Hazardous Materials Identification System (HMIS) rating system placards or signs. All containers will be regularly checked for leaks, and must be clearly labeled, tagged, marked (e.g., signs, labels, DOT/HMIS/NFPA placards, etc.) indicating the name/type of hazardous chemical(s) and the H&S hazards. MSDSs for hazardous materials used or stored at the Site will be maintained in the field trailer or at a central treatment system work site location.

General safety rules, as presented in Table 5, will be in effect at the Site. These rules are designed to minimize exposure to potential work site hazards.

4.1.1 Lock-Out/Tag-Out Procedures

As the name implies, lock-out/tag-out employs a device such as a tag, lock, or fastener to prevent startup or energizing of powered equipment, pumps, mixers, presses, and other machinery that could move or result in releases of substances (corrosive liquids, vapors, etc.) that would put field personnel in danger. To prevent any unexpected startup or energizing, a lock is secured to the equipment/machinery power source in a manner that prevents activation of the equipment during servicing, maintenance, or troubleshooting activities. All site personnel will be trained on the lockout/tag out procedures for this project.

Personnel are never to attempt to perform maintenance, service, or otherwise work on any piece of equipment or machinery whose startup could pose a potential hazard without first completing lock-out/tag-out procedures. Examples include regular maintenance activities such as

disassembling equipment for maintenance, checking for leaks, lubricating bearings, cleaning probes, checking tightness of piping unions, changing oil, replacing or checking valves.

Lock-out will consist of turning off the equipment/machinery and setting the main energy source in the "safe" or "off" position, and placing a padlock on the switch that will hold it in that position. The control panel should be equipped with a hasp that permits tagging it or locking it with a padlock. The energy sources for virtually all powered machinery, pumps, mixers, presses, and other machinery are controlled by switches located on the control panel.

Lock-out/tag-out procedures are designed to completely shut down the powered equipment and machinery. -The procedures, to be completed only by one member of the field team or authorized support personnel, will be conducted in the following sequence:

Preparation for shutdown. Prior to turning off or shutdown of equipment or machinery, identify the type and magnitude of the energy source, hazards of the energy to be controlled, and the method or means to control the energy. Be aware of the possible hazards that may result from turning off or de-energizing the equipment. Follow specified orderly shutdown procedures (refer to the instructions in the appropriate O&M manuals for the specific machinery). Notify all other personnel of the lock-out. A lock-out/tag-out placard should be posted in a clearly visible location to alert personnel that switches are subject to lock-out.

Equipment/machinery shutdown. Turn off or shut down the equipment by moving the appropriate switch to the "safe" or "off" position.

Isolation. Locate the main equipment/machinery power switch and move the switch to the "off" or "safe" position to render it inoperative.

Lock-out. Place the number-coded padlock on the main equipment/machinery power switch, which has been placed in the "off" or "safe" position. Ensure that the padlock is secured and cannot be removed and the switch cannot be moved from the "safe" position.

Tag-out. Secure a minimum size 3-inch by 5-inch card to the padlock with large block letters in indelible ink, stating “Do Not Turn On! Personnel Injury Could Result”

Stored energy. As appropriate, relieve, disconnect, restrain, and otherwise render safe by repositioning, blocking, bleeding etc., all potentially stored or residual energy, including springs, rotating flywheels, hydraulic systems, electrical system, air, gas, water or other liquid pressure. If there is a possibility of re-accumulation of stored energy to a hazardous level, verification of isolation must be continued until the servicing or maintenance is complete or until the possibility of such accumulation no longer exists.

Verification of isolation. Prior to initiating work on locked-out equipment/machinery, verify that isolation and de-energizing has been accomplished by attempting to start it up in the normal manner.

Before lock-out devices are removed and energy is restored, the following procedures must be completed:

- Ensure that the machinery/equipment components are operationally intact; inspect the work area to ensure that all nonessential items have been removed;
- Advise other personnel that lock-out devices are being removed and ensure that personnel are safely positioned or removed from the affected machinery/equipment work area; and
- Remove the lock-out device from the main system control panel switch. Whenever the individual who applied the lock-out is unavailable to remove it, it may be removed under the direction of another authorized person provided that every attempt has been made to contact the individual who applied the lock-out, and ensuring that the individual is made aware that the lock has been removed before he/she resumes work.

4.1.2 Buddy System

The "buddy system" ensures that each field team member will have the assistance of a partner who will be able to observe symptoms of chemical exposure, illness, secure emergency assistance, and provide direct assistance whenever necessary. The "buddy system" will be in effect during all non-routine or potentially hazardous activities. However, many routine procedures can be safely handled by one person. Routine activities include observation, adjustment of valves or controls, sample collection, and maintenance activities that do not require electrical power tools, ladders, or the potential release of any substance. For these routine activities the required use of the "buddy system" can be waived. Non-routine operations, such as major equipment repair or maintenance activities, working near excavations, and mitigation of any material release or line-breaks, will require the presence of two people at the work site.

4.2 Personal Protective Equipment

The level of PPE required at the Site will depend not only on monitored conditions and hazards but also on the specific tasks to be performed. All personnel must wear appropriate PPE when activities involve potential exposure to chemicals or other exposure hazards that cannot otherwise be adequately controlled through engineering or administrative controls. Respiratory, dermal, eye, head, hand, and foot protection are required when activities may result in exposure to chemical hazards. Chemical hazards, as discussed in Section 4.0, include dermal, eye, or inhalation exposure to corrosives and heavy metals in soil or dust generated during earth-moving activities. The chemicals may be in dusts, liquid, or solid form. To avoid or control exposure to these substances, personnel may be provided with, and required to use, PPE that is specific to the individual's work tasks and potential work site hazards. An eye wash and deluge shower will be available at the site.

4.2.1 EPA Level D

EPA Level D is the basic work uniform that will be used at the Site. This includes the following PPE: hard hat, steel-toed safety boots (leather, rubber, PVC, neoprene when exposed to AMD, process solutions in the ponds, or other corrosive liquids), and chemical-resistant (nitrile) or heavy-duty work gloves. Safety glasses should also be worn when appropriate (e.g., when the potential for contact from splashing or spraying fluids may exist). This level of protection is the minimum required during routine operations at the Site where there is no potential inhalation or dermal exposure to vapors or corrosives. This level of PPE can be modified based on the site-specific conditions. For example, hard hats may not be necessary when there is no heavy equipment or overhead threats at the site. The field staff should use their best judgment and err on the side of conservatism in their selection of the PPE necessary for each task.

4.2.2 EPA Level D - Modified

EPA Level D - Modified includes the above PPE as well as chemical-resistant Tyvek/Saranex coveralls, rubber apron, chemical-resistant face shield, steel-toed rubber or neoprene safety boots, and chemical-resistant gloves will be worn when there is potential dermal or eye exposure to corrosives but, based on results of personal monitoring, no respiratory exposure to airborne particulates or vapors exceeding PELs. This level of protection is the minimum required when mixing or replacing corrosives as long as there is no inhalation exposure to particulates or vapors.

4.2.3 EPA Level C

EPA Level C is used when airborne concentrations are at levels that pose a potential inhalation hazard but are low enough that an air-purifying respirator (APR) provides sufficient protection. Level C PPE will include all of the above Level D - Modified PPE plus a half or full-face APR with combination HEPA/acid gas cartridge. This level of protection is the minimum required when airborne concentrations exceed PELs. Level C will be worn when personal monitoring indicates action levels or PELs, such as those for inorganic arsenic have been exceeded, or there is an increased potential for exposure to dust, particulates, or other airborne contaminants. Tasks that could potentially require respiratory protection include removal or handling of contaminated soil that has been dried to the point that airborne particulates are generated. Issuance, fitting, and testing of respirators shall be conducted in accordance with a respiratory protection plan. The End of Service Life for cartridges is 8 hours or when breathing becomes difficult for the user, whichever is sooner. The ESL will be recalculated or driven by the appropriate MSHA standard if exposure measurements indicate significant exposures exist.

4.2.4 EPA Levels A and B

There are no provisions to upgrade to Level A or B during this project. If conditions are encountered requiring such an upgrade, operations would be discontinued and personnel removed from the Site until such time as the Project Manager, Site Safety Coordinator, and HSM, in consultation with the U.S. EPA Region IX Remedial Project Manager and Regional Board establish it is safe to resume work in Level C or Level D PPE. If Level B or Level A is

required, a SHSP modification will be prepared and require approval by the HSM specifying the protocols and PPE to be used.

4.3 Personal Monitoring/Air Sampling

Personal air monitoring with device(s) attached to personnel is not a planned activity covered under this SHSP, although such monitoring could be included as part of the SHSP if site conditions or activities change. Personnel who are working in windy conditions with blowing dust should avoid inhalation of dust particles by seeking shelter from the blowing dust or by wearing a half or full-face air-purifying respirator. Face shields may be worn to provide added protection against wind-blown dust particles. Issuance, fitting, and testing of respirators shall be conducted in accordance with a respiratory protection plan.

SECTION 5.0

SITE CONTROL

Access to the Site will be limited to authorized federal, state, and local regulatory personnel, Atlantic Richfield employees, Brown and Caldwell employees, and contractor personnel. There is sufficient placarding and signs providing warning or cautioning language that restricts entry to authorized personnel. Only visitors who have received prior authorization from appropriate EPA, NDEP, or BC supervisory personnel will be permitted entry to the Site. All authorized visitors will be advised of the potential hazards at the work site.

The BC field team will be responsible for coordinating access and security to those areas of the site where BC activities are being conducted. All individuals will be required to sign in and sign out when entering and leaving the site. A sign-in register will be available in the administration building. The field team will ensure that appropriate warning signs or temporary fencing will be posted at work area entrances to delimit those areas that are "off limits" to unauthorized personnel, and to indicate potentially hazardous conditions or required precautions (e.g., excavations, hard hat area, eye protection required, no smoking).

Personnel from the NDEP and SRK Engineering are engaged in field activities throughout the Site, and have control over access and safety issues at those areas where either group is conducting work.

SECTION 6.0

DECONTAMINATION PLAN

Given the limited direct contact that personnel are expected to have with the AMD, process solutions, sludge, or other hazardous materials, extensive decontamination procedures will not be required for routine activities. However, if activities result in conditions where there is direct contact with contaminated media or other hazardous substances, then the procedures discussed in the following paragraphs should be employed to ensure that both personnel and equipment leaving the Site are free of contamination. The field team in consultation with the Field Managers or Site Safety Coordinators can modify procedures, as necessary, thereby adapting them to existing work site conditions (e.g., changes in the nature and extent of contamination, PPE level, work tasks, etc.).

6.1 Personnel Decontamination

All disposable PPE and other equipment will be discarded and properly disposed of in double plastic trash bags. Any reusable PPE will be thoroughly decontaminated.

Boots encrusted or heavily soiled with potentially contaminated sludge, dirt or other substances will be cleaned using a stiff brush and water. All disposable coveralls and outer gloves will be discarded in a lined trash can or plastic bag for subsequent disposal.

Rubber boots are to be washed using a scrub brush and a non-phosphate detergent-water solution (e.g., Alconox or Liquinox) followed by a thorough rinse with clean water.

Hard hats and safety glasses will be cleaned with a damp cloth or paper towel and rinsed with clean water.

6.2 Equipment Decontamination

Reusable equipment will be decontaminated by washing, or a series of washings, using a detergent-water solution (Alconox or Liquinox) followed by a series of rinsings using generous amounts of water. The rinsate will be passed through the treatment system.

6.3 Disposition of Operation-Derived Wastes

All disposable PPE, equipment, plastic sheeting and other items will be placed in plastic trash bags for disposal. These items are generally not considered hazardous waste and are not expected to require disposal at a hazardous waste disposal facility.

Substances that are suspected of being hazardous will be sampled and submitted for analysis to ensure proper disposal. The field team, in consultation with the Project Engineer, will ensure that wastes are properly containerized, secured, stored, and characterized in accordance with the provisions of the Sampling and Analysis Plan.

An Atlantic Richfield Company representative will be responsible for signing any hazardous waste manifests.

SECTION 7.0

EMERGENCY RESPONSE PROCEDURES

This section describes contingencies and emergency response procedures to be implemented at the Site. The procedures are designed to provide the BC and subcontractor personnel with the guidance necessary to handle most emergency situations.

7.1 Emergency Assistance

In the event of an emergency, call 911 for emergency assistance immediately. The Lyon County Sheriff will identify and contact the appropriate responders based upon the nature and severity of the emergency situation. Medical emergencies will be referred to the Mason Valley Fire Department, who will also identify and contact the appropriate responders based upon the nature and severity of the injuries. Atlantic Richfield Company and Brown and Caldwell staff should also be notified as quickly as possible.

The following information must be provided to the Atlantic Richfield and Brown and Caldwell project managers:

- Nature of the emergency (e.g., fire or spill)
- Location of emergency
- Size and extent of emergency
- Materials involved
- Injury to personnel

Upon being notified, the Atlantic Richfield Company Environmental Manager, or designee (usually emergency coordinator) will assess the situation to determine the following:

- Hazards involved
- Magnitude of the problem
- Resources threatened

Table 1 is a comprehensive list of additional emergency response phone numbers and **Figure 3A and Figure 3B show the route to the nearest medical facility, South Lyon Medical Center**. Directions to medical facility are described below. Brian Bass is the designated site emergency coordinator and has final authority for first response to on-site emergency situations. In the event that Brian Bass is not on site, Chad Leonard or the senior on-site person will be designated the site emergency coordinator with all applicable authority.

All accidents, including injuries, incidents, and near misses must be reported to BC and Atlantic Richfield Company. The incident must be reported as soon as practical (no longer than an 8-hour shift) to the BC and Atlantic Richfield Company health & safety personnel. Copies of the incident reports must be provided to BC and Atlantic Richfield Company.

Upon arrival of the appropriate emergency response personnel, the site emergency coordinator shall defer all authority but shall remain on the scene if necessary to provide any and all possible assistance. At the earliest opportunity, the site health & safety coordinator or the site emergency coordinator shall contact the BC and Atlantic Richfield Company Project Managers or Health and Safety Officers. Contact information is listed in Table 1.

7.2 Site Communication

The primary means of communication for emergency situations will be conventional telephone or cell phones. If hand-held two-way radios are available at the site, they should be used to facilitate safe and efficient operations when individuals are working apart and out of sight or sound from each other. These radios can be used in lieu of the buddy system when individuals are working alone and out of sight. Radio capability should be verified every ½ hour, at minimum, by establishing mutual contact. Depending on the cell phone service being used, cell phone reception may be available at the site. The closest conventional telephone is available at the administration building.

Emergency Evacuation

In the event of an emergency that requires evacuation of the site, the following alarm procedures shall be followed:

- Signal is three short blasts from a sounding device (e.g., vehicle horn, whistle, etc.)
- All personnel shall immediately proceed to their vehicle and leave the site
- All personnel without vehicles shall immediately proceed to the vehicle they arrived in and meet with the driver of the vehicle.

7.3 Potential Incidents

Although unlikely, the following situations could occur at the Site and would require emergency response actions:

- Release of hazardous vapors/gases;
- Uncontrolled release or spill;
- Fire;
- Medical emergency;
- Acute exposure (inhalation, skin contact, eye contact); and
- Discovery of old dynamite or blasting caps.

7.3.1 Release of Hazardous Vapors or Gases.

In the event of a sudden release of hazardous vapors or gases constituting a potentially hazardous situation (e.g., adequate respiratory protection is unavailable, IDLH or explosive atmospheres, imminent worker or public safety or health hazard) the field team will halt closure activities and evacuate the work area or Site using appropriate emergency signal of three short blasts (air horn, alarm) or hand signals. The senior field team member will notify appropriate emergency response and supervisory personnel identified in Table 1. The field team will assist the fire captain and any response personnel to control and stop the release. After the release has been halted, the field team

in consultation with the Project Engineer or Site Safety Coordinator, will be responsible for monitoring the work site for the presence of any remaining airborne hazards and determine when it is safe for BC and subcontractor personnel to return to work activities.

7.3.2 Containment of Releases and Spills.

The H&S Coordinators and the field team will ensure that sufficient quantities of sorbent materials, pads, booms, or pillows and other cleanup materials and equipment are available at the work site to neutralize and/or absorb spills and provide for a quick, easy, and safe response to any release or spill of fuels or hazardous materials.

7.3.3 Fire.

In case of a potentially uncontrollable fire, the senior field team member or other personnel will immediately call 9-1-1 to notify the local Mason Valley fire department and determine the extent of the fire, assess the hazard posed to on-site personnel, and whether or not it is safe to attempt to control or extinguish the blaze while waiting for the Fire Department to arrive.

Class A:B:C fire extinguishers will be available at the Site to control or extinguish small or incipient fires. If the fire can not be controlled, the field team will evacuate all personnel to a location upwind of the work site. If it is still operating and it is safe to do so, the field team will attempt to shut off the treatment system. The senior field team member will advise the on-site fire chief of the location, nature and types of hazardous materials or fuels stored at the Site.

7.3.4 Medical Emergency.

In the event of a serious injury or illness, call 9-1-1 for emergency assistance immediately. The Lyon County Sheriff will refer medical emergencies to the South Lyon Medical Center in Yerington, who will identify and contact the appropriate responders based upon the nature and severity of the injuries.

If the nature of the illness or injury is such that the individual can be safely moved, without any potential for further injury, the individual may be immediately transported to the South Lyon Medical Center. Workers with suspected back or neck injuries are not to be moved. In such instances the worker should be stabilized while waiting for assistance. First aid kits will be maintained at the Site for treating minor injuries.

7.3.5 Chemical Exposure.

In the event of respiratory exposure, dermal or eye contact, or ingestion of a potentially toxic substance, the following procedures will be followed.

- Respiratory Exposure (Inhalation). Move to fresh air immediately. Any loss of consciousness or exposure to elevated levels of known toxic substances, even if the individual appears to have fully recovered, requires immediate treatment and/or surveillance by a qualified physician.
- Dermal Contact. Wash/rinse affected area for at least 15 minutes. An emergency drench system, and portable eye wash station are located at the Site. Transport worker for treatment to the nearest medical facility.

- Eye Contact. Flush eye or eyes continuously for 15 minutes using the emergency eye wash, then transport worker to the nearest medical facility, or ophthalmologist. Follow-up treatment or examination by a qualified physician is required.
- Ingestion. Immediately transport to the nearest available emergency medical facility. The Regional Poison Control Center should be contacted for instructions if the victim cannot be immediately transported to the emergency facility or the emergency facility cannot be contacted.

7.3.6 Old Dynamite or Blasting Caps.

Given that the Site was mined and is located in a mining area, it is possible that old sticks of dynamite or blasting caps could still be present. The field team is to be alert to the fact that old dynamite sticks that appear to be empty may still contain residual shock sensitive explosive compounds and should not be touched. If dynamite or blasting caps are encountered, the senior field team member is to implement the following procedures:

- Back off. Do not handle dynamite;
- Establish an exclusion zone (EZ); the radius of the EZ would be a minimum of 200 feet for a single stick, and up to 1500 feet for several sticks;
- Evacuate all personnel from the EZ;
- Immediately notify all personnel, and the Project Manager, Site Health & Safety Coordinator, or Office Health & Safety Coordinator;
- Mark the location of the dynamite clearly on a site map;
- The Project Manager or Health & Safety Coordinator will notify Atlantic Richfield Company, and contact the appropriate response personnel to remove the explosives.

Emergency telephone numbers are provided in Table 1. The location of the closest emergency medical facility is depicted in Figures 3A and 3B.

7.4 Adverse Weather Conditions

In the event of adverse weather conditions, the senior field team member, in consultation with the Project Manager and subcontractor personnel will determine if operations at the Site and/or treatment system work area can be safely continued. Some of the conditions posing potential hazards include:

- Extremely cold temperatures (i.e. potential for cold stress);
- Dangerous weather-related working conditions (e.g., high winds, rain, snow, etc.);
- Limited visibility; and
- Electrical storms.

7.5 Notification

In the event of an injury-accident, hazardous substance release, or emergency situations (existing or imminent), the field team must notify the BC and Atlantic Richfield Company Health & Safety personnel as soon as possible. Table 1 lists the Health & Safety personnel to be contacted.

Accidents and incidents will be reported to the Project Manager and H&SM on an Injury/Illness/Incident Report form (included in Appendix B) within 24 hours of such an occurrence. After an occurrence, the field team will remain at the Site until released by the Project Manager or other on-site BC or subcontractor supervisory personnel. Circumstances of the occurrence and preventative measures will be discussed with all personnel prior to resuming regular activities during the next safety meeting. The Site Health and Safety Coordinator will investigate causes and recommend appropriate control measures. The Project Manager is responsible for reviewing the information and determining if further investigation or corrective measures are required. The Project Manager will notify the EPA, Regional Board and appropriate federal and state agencies (e.g., MSHA) of the occurrence of any recordable injuries or illnesses or of any reportable incidents (e.g., spills, releases).

The field team is responsible for reporting all work-related injuries or illnesses as soon as possible to the Project Director, Office Safety Coordinator or other appropriate supervisory personnel. BC is responsible for maintaining field personnel H&S files, including MSHA logs, training and medical surveillance certificates and records, and workers compensation files. Employee medical files, including records of work-related exposures, accidents/illnesses, are maintained by BC's occupational health physician, Continuum Health Management Solutions. The subcontractors will be responsible for maintaining their own H&S files.

Accident and incident reporting to Atlantic Richfield Company shall be conducted in accordance with Section 7.6, in addition to the procedures described in this SHSP.

7.6 Atlantic Richfield Reporting Requirements

Notification & Reporting Procedures
Incidents are classified intro three basic types – Major (including High Potential Incidents and High Potential Near Misses), Non-Major, and Near Miss. When an incident occurs an incident/near miss investigation report needs to be completed using the **Traction System**. The first step is to assess the severity, based on the Incident Notification and Reporting Table Definitions (**Table 2**). The initial evaluation determines the appropriate notification.

When an incident occurs, the staff and contractors must notify the appropriate contacts (**Figure 2**, Notification Callout Tree), verbally or via email, as required. The notification often includes an Initial Report. Please refer to **Table 3**, Notification and Reporting Process Table, for notification and reporting requirements. Once the severity is assessed, the Project Manager, HSE Manager, BU Leader, and BP Group Senior Managers are notified as required. Once staff has completed an investigation, a completed report must be submitted. It is at this time that corrective action is recommended and monitored.

Key Points

- Whenever a Major Incident or High Potential Incident occurs, the Project Manager and Environmental H&S Representative must receive immediate verbal notification, followed by a written report (using the Major Incident or High Potential Incident form and the Traction web based system).

- All incidents should be documented using the **Traction System**. Traction is a web based system used to track incidents, advanced safety audits, hazops, and audits. If you are not familiar with the traction system and need access or more information, contact Lorri Birkenbuel at 406-563-5211 ext. 410.

- The **BP Incident Notification Center (1-800-321-8642 or 312-856-2200**) is a resource for communications as well as emergency response. If needed, the Incident Notification Center can be called for notification support on Major Incidents when BP personnel are not immediately available and when an incident has occurred where the severity is unknown or additional support may be needed.

- For all Major Incidents and High Potential Incidents, the Incident Notification Center will be contacted to assist in notifications.

TABLE 2
INCIDENT NOTIFICATION AND REPORTING TABLE DEFINITIONS

Incident Category	Transportation	Material Release	Environmental Event	Loss of Damage		Security	Injury/Illness	Complaints
Incident Severity	**Road/Third Party Transport (i.e. - Vehicle Incidents)**	**Material Release**	**(I.e. Agency Action or OTHER Event)**	**Unplanned Business Interruption**	**Equip/Prop/Fire / Explosion**	**Security (i.e. theft, assault, fraud)**	**Personal Injury / Illness**	**Public/3rd Party**
MAJOR / HIGH POTENTIAL Refer to BP Group Major Incident and High Potential Incident Reporting Guideline	Any incident resulting in a fatality or multiple serious injuries	Any spill or release > 100 barrels or less in a sensitive area, RQ, off site impact, any spill on navigable water, release of 10 tons of classified Chemical material, or any spill > 1 barrel and has a High Potential	SIGNIFICANT Adverse reaction from authorities	Any accidental damage having a cost exceeding US $500,000	Any fire or explosion with offsite or significant onsite impact / any use of fire fighting equipment – High Potential Property Damage >$500,000	Any serious threats to security, bomb threats, or kidnapping threats – High Potential	Any injuries or illnesses resulting in fatalities or multiple serious injuries	SIGNIFICANT Adverse reaction from media, NGO's or the general public
NON-MAJOR INCIDENTS	Any incident involving a BP vehicle including under the influence of D&A ($0 Cost Threshold) Any contractor incident involving vehicle over 3.5 tons	Any spill < 100 barrel Unplanned releases include any spill volume where authorities are notified	Any notice of fine, NOV, consent order, citations, penalties, or regulatory audits	Any unplanned business interruption including hitting underground utilities, product lines, or claim, impact on operating facility business.	Any other fire / explosion not categorized as a Major Incident Property Damage of $500 - $499,000)	Any non-serious, threat to security including vandalism.	Any injury or illness resulting in a DAFWC, BP exposure, OSHA Recordable or First Aid	Any incident that causes adverse reaction from the public, or received significant media attention
<u>NEAR MISS / UNSAFE CONDITION</u> or Behavior and/or doesn't meet the definitions of a Major or Non-Major Incident	Any contractor light vehicle or incident without injury or property damage Any potential BP employee or Contractor vehicle incident (actual accident did NOT occur)	Any potential for spill or release	Any adverse reaction from authorities	Any complaint filed by an Operating Facility Business	Any risk of fire or explosion (i.e. working in LEL conditions, etc.) Property Damage less than <$500 (Does not include vehicle Damage for accidents involving BP employees)	N/A	Any potential for an injury/illness.	N/A

In case of an incident or serious potential incident, call the Project manager for the site and the Safety Representative for Atlantic Richfield. They will make other notifications within Atlantic Richfield.

Initial notification must be made immediately to the Atlantic Richfield Environmental Manager and Safety Representative, no matter how small the incident. (Table 4, Notification and Reporting Table)

TABLE 3
INCIDENT NOTIFICATION AND REPORTING PROCESS TABLE

	Notification		Initial Reporting		Investigation	
Incident Severity	**Notification required**	**When**	**Forms / Reports***	**When**	**Forms / Reports***	**When**
MAJOR/ HIGH POTENTIAL	• Project Manager • HSE Representative • Incident Notification Center	Immediately	Major/High Potential Incident Announcement Forms OSHA 200 Log (as applicable)	Immediately	Major Incident Investigation Summary Report (10 day and 60 day)	10 Days (Preliminary) 60 Days (Final)
NON-MAJOR	• Project Manager • HSE Representative	Immediately	GEM Incident / NM Inv. Report Form or equivalent OSHA 200 Log – as applicable	Within 24 Hours	GEM Incident / NM Inv. Report Form	14 Days or as otherwise noted
NEAR MISS	• Project Manager • HSE Representative	Immediately	GEM Incident / NM Inv. Report Form or equivalent	Within 72 Hours	GEM Incident / NM Inv. Report Form, when needed	14 Days or as otherwise noted

NOTE: If an Environmental Manager \ Health, Safety, and Environment (HSE) Representative is not available, Contractor is responsible for notifying another ATLANTIC RICHFIELD COMPANY employee.
* Initial and Final Reports may be done with participation from both Contractor and ATLANTIC RICHFIELD COMPANY Representatives, depending on severity.

7.7 Exposure/Injury Medical Surveillance

Any employee who suffers an illness, injury, or chemical exposure is required to see a physician. Depending upon the extent and type of exposure, illness, or injury, it is critical to perform follow-up testing within 24 to 48 hours. BC will ensure that appropriate medical follow-up testing is conducted, where appropriate. The physician responsible for conducting the employee's medical surveillance examinations shall be notified and consulted to determine the type(s) of tests required to accurately monitor the employee. A worker may return to work only with the written approval of the attending physician.

7.8 Recordkeeping

In addition to MSHA and record keeping requirements, the Project Manager will maintain a project file of any H&S-related activities (monitoring, sampling) and incidents occurring at the Site. Any exposures or potential exposures are to be recorded, as well as accidents or incidents

that require the filing of a report (e.g., injuries, illnesses, accidental damage to property, or "near miss" occurrences that could have resulted in personal injury).

7.9 LOCAL TELEPHONE ROSTER

EMERGENCYS: CALL 911

LOCAL TELEPHONE ROSTER

POLICE, FIRE, AND AMBULANCE			
Yerington Police Dept.		Tel 775-463-2333	
Lyon County Sheriff	30 Nevin Way Yerington, NV 89447	Tel 775-463-6600 Fax 775-463-6610	Jeff Page
Yerington Fire Dept.	See Mason Valley Fire Dept	See Mason Valley Fire Dept	Chief: Steve Tognoli
Mason Valley Fire District	118 S. Main Yerington, NV 89447	Tel 775-463-6535 Fax 775-463-6537	Chief: Steve Tognoli
Careflight	450 Edison Way Reno, NV 89502	Tel 800-648-4888	
HOSPITALS & MEDICAL CENTERS			
South Lyon Medical Center	Whitacre and Surprise Yerington, NV 89447	Tel 775-463-2301 fax 775-463-4300	Kim Billmeyer
Yerington Paiute Tribe Medical Center	170 Campbell Lane Yerington, NV 89447	Tel 775-463-3335	
Northern Nevada Medical Center	2375 E. Prater Way Sparks, NV	Tel 800-874-5775	
UTILITIES			
Telephone- Nevada Bell and others	Repair/Service hotline	Tel 775-333-4611	
Gas- Southwest Gas	Repair/Service hotline	Tel 775-882-2126	
Gas- Paiute Pipeline	400 Eagle Station Ln. Yerington, NV 89447	Tel 775-882-0148	
Water			
Electric- Sierra Pacific	Repair/Service hotline	Tel 800-962-4169	
GOVERNMENTAL AGENCIES			
Lyon County Managers Office	27 S. Main Street Yerington, NV 89447	Tel 775-463-6531 Fax 775-463-6533	Manager: Stephen Snyder
Yerington Mayor's Office	102 S. Main Street Yerington, NV 89447	Tel (775) 463-3511	
Yerington City Managers Office	102 S. Main Street Yerington, NV 89447	Tel (775) 463-3511	Manager: Dan Newell
Nevada State Health Dept. / Community Health	26 Nevin Way Yerington, NV 89447	Tel (775) 463-6539 Fax (775) 463-6534	Jana Patterson

7.10 NEVADA TELEPHONE ROSTER

HIGHWAY PATROL			
Nevada Highway Patrol-Carson City	555 Wright Way Carson City, NV 89711	(775) 687-5300	
Nevada Highway Patrol-Reno	357 Hammill Lane Reno, NV 89511	(775) 688-2500	
GOVERNMENTAL AGENCIES			
Nevada Emergency Response Commission (NERC)	107 Jacobsen Way Stewart Facility Carson City, NV 89711	Tel (702) 687-6973	Mr. John Drew
Nevada Division of Environmental Protection (NDEP)	333 W. Nye Lane, Room 138 Carson City, Nevada 89706-0851	Tel (775) 687- 4670 – Fax 687-5856	
Bureau of Waste Management / NDEP	123 West Nye Lane, Room 120 Carson City, Nevada 89706-0851	tel (775) 687-4670 fax (775) 687-6396	
NV Dept of Transportation	1263 South Stewart St. Carson City, Nevada 89712	tel 775-888-7000 fax 775-888-7115 Lyon Co. (District 2) tel (775) 834-8300 fax (775)834-8390	
Division of Emergency Management / NBPS	2525 South Carson St. Carson City , NV 89701	Tel (775) 687- 4240 Fax 775- 687- 6788	
Bureau of Water Pollution Control/NDEP	333 W. Nye Lane, Room 129 Carson City, 89706-0851	tel (775) 687-4670 Fax (775) 687-5856	
Bureau of Water Quality Planning/NDEP	333 West Nye Lane, Suite 138 Carson City, NV 89706-0851	tel (775) 687-4670 Fax (775) 687-6396	
Nevada Hazardous Materials and Fire Training Center	107 Jacobsen Way Carson City, Nevada 89711	Tel: (775) 687 - 6499 Fax: (775) 687 - 5122	

7.11 FEDERAL TELEPHONE ROSTER

GOVERNMENTAL AGENCIES			
National Response Center	c/o United States Coast Guard 2100 2nd Street, SW - Rm 2611 Washington, DC 20593-0001	(800) 424-8802	
CHEMTREC Chemical Transportation Emergency Center	Telephone information	Emergency- 800-424-9300 Customer Service- 800-262-8200	
Agency for Toxic Substances and Disease Registry (ATSDR) Region IX	75 Hawthorne Street Rm 100, Mail Code HHS-1 San Francisco, CA 94105	(415) 744-1771 Emerg. Response: (404) 498-0120	
Federal Emergency Management Agency (FEMA) Region IX	Building 105 Presidio of San Francisco San Francisco, CA 94129	(202) 646 3900 (800) 462-9029	
Poison Control Center	Oregon Poison Control Center (nearest PCC to Lyon Co.)	Tel 800-222-1222	
Superfund Hotline	EPA	Tel (800) 533-3508	
Occupational Safety and Health Administration (OSHA)		(800) 321-OSHA (6742)	

ATLANTIC RICHFIELD COMPANY

Dave McCarthy Day 406-563-5211 ext 430 Cell 406-691-2721

Lorri Birkenbuel Day 406-563-5211 ext 410 Evening 406-691-2200 or 406-494-4215

BROWN AND CALDWELL

Chuck Zimmerman, Project Manager
BC Carson City, NV Day 775-883-4118 Evening 775-882-6931

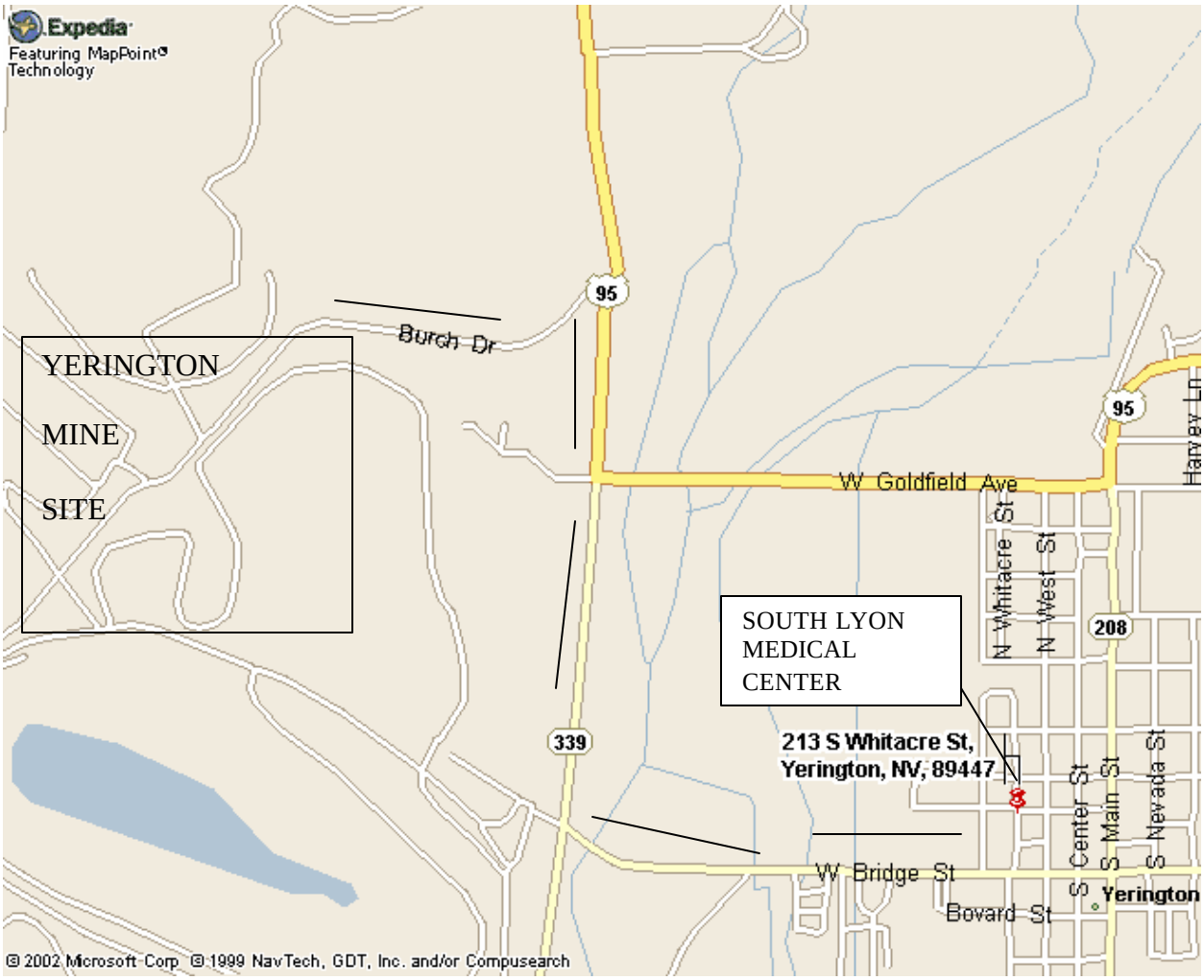
Brian Bass, BC Field Manager/Primary Site Health & Safety Coordinator
BC Carson City, NV Day 775-883-4118 Evening 775-853-2752

Dean Wall, Corporate Health & Safety Manager
BC Walnut Creek, CA Day 925-210-2469

Table 4. General Safety Rules for the Yerington Mine Site

1.	Permit to Work (BP Golden Rule): Before conducting any work that involves confined space entry, work on energy systems, ground disturbance where utilities or hazards are buried, or hot work in potentially explosive environments, a work permit must be obtained.
2.	Energy Isolation (BP Golden Rule): Any isolation of energy systems (mechanical, electrical, process, hydraulic and others) can not proceed unless the energy source is discharged and/or disconnected, locked and tagged, and tested to ensure the system is off and isolated. Isolation should be monitored on a regular time basis.
3.	Ground Disturbance (BP Golden Rule): Work that involves any type of excavation or depression in the ground surface can not proceed until a hazard assessment is completed, and all underground utilities and hazards have been identified and isolated.
4.	Confined Space Entry (BP Golden Rule): Entry into any confined space can not proceed unless all other options have been ruled out, a permit has been issued, posted, and communicated to all personnel, all persons are competent to do the work, all energy sources have been isolated, atmosphere has been tested, a stand-by person has been authorized, and unauthorized entry is prohibited.
5.	Working Heights (BP Golden Rule): Working at heights of six feet or greater above the ground requires a fixed platform with guard rails or fall arrest equipment that limits free fall to less than six feet. Fall arrest equipment must be inspected prior to use.
6.	Lifting (BP Golden Rule): Cranes, hoists, or other lifting devices will not be used until an assessment of operations is conducted, operators are checked for certification and training for the equipment, devices and equipment have been certified within the last 12 months, the load does not exceed the specified limit for the equipment, safety devices are operating correctly, and all equipment has been inspected prior to lift.
7.	Driving (BP Golden Rule): All vehicles must be in safe working order. The number of passengers and overall loads must not exceed the manufacturers design. Seat belts must be worn by all occupants at all times. The use of hand held cell phones or radios while driving is prohibited.
8.	Management of Change (BP Golden Rule): Work arising from changes to organization, personnel, or procedures can not proceed unless a Management of Change process is completed.
9.	Visitor access to the treatment system work site will be limited to areas outside of designated work zones unless specifically approved by the senior on-site personnel.
10.	All personnel will be trained in the site-specific emergency procedures, including the location of emergency telephone numbers and hospital route maps.
11.	Personnel working alone at the Site must be in verbal communication (e.g., cellular phone or two-way radio) with their field team member or other support personnel.
12.	Equipment shall be kept in proper working order and shall be kept free of accumulated lubricants, contaminants or other hazardous or flammable substances.
13.	Safety briefings will be held on a weekly basis and on as needed basis, by the field team.
14.	Eating, drinking, or smoking is prohibited except in designated areas outside of the immediate treatment system work areas.
15.	PPE used at the Site will be at the protective level specified by the Site Health and Safety Coordinator. Generally EPA Level D PPE will be required which, at a minimum, includes steel-toe boots, hard hat, and protective glasses.
16.	Authorized personnel with facial hair (i.e., over one day's growth) will not be allowed in designated work areas where respiratory protection is required.
17.	Personnel and authorized visitors shall remove and discard all disposable PPE prior to leaving the work Site.

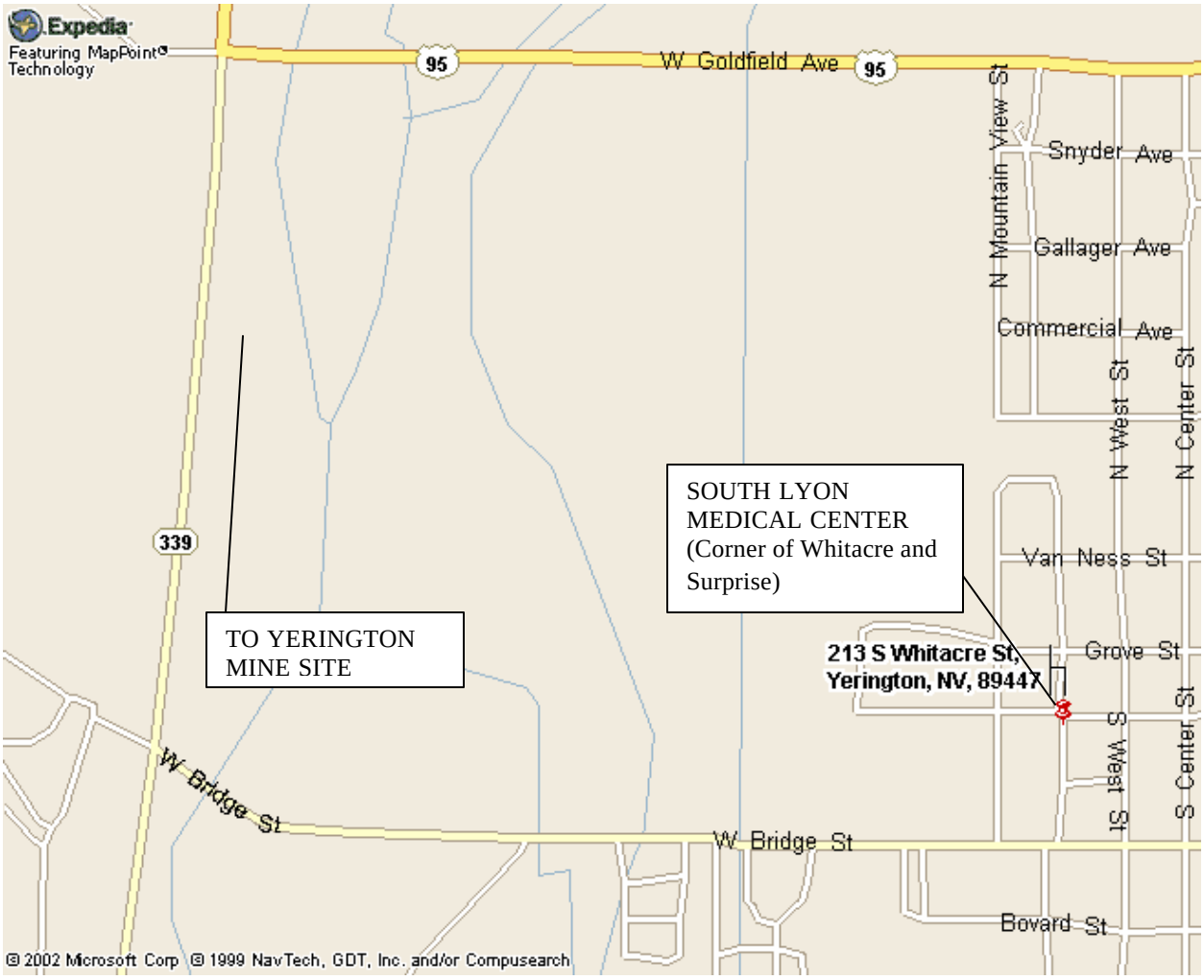
FIGURE 3A
MAP OF ROUTE FROM MINE SITE TO HOSPITAL (Large scale)

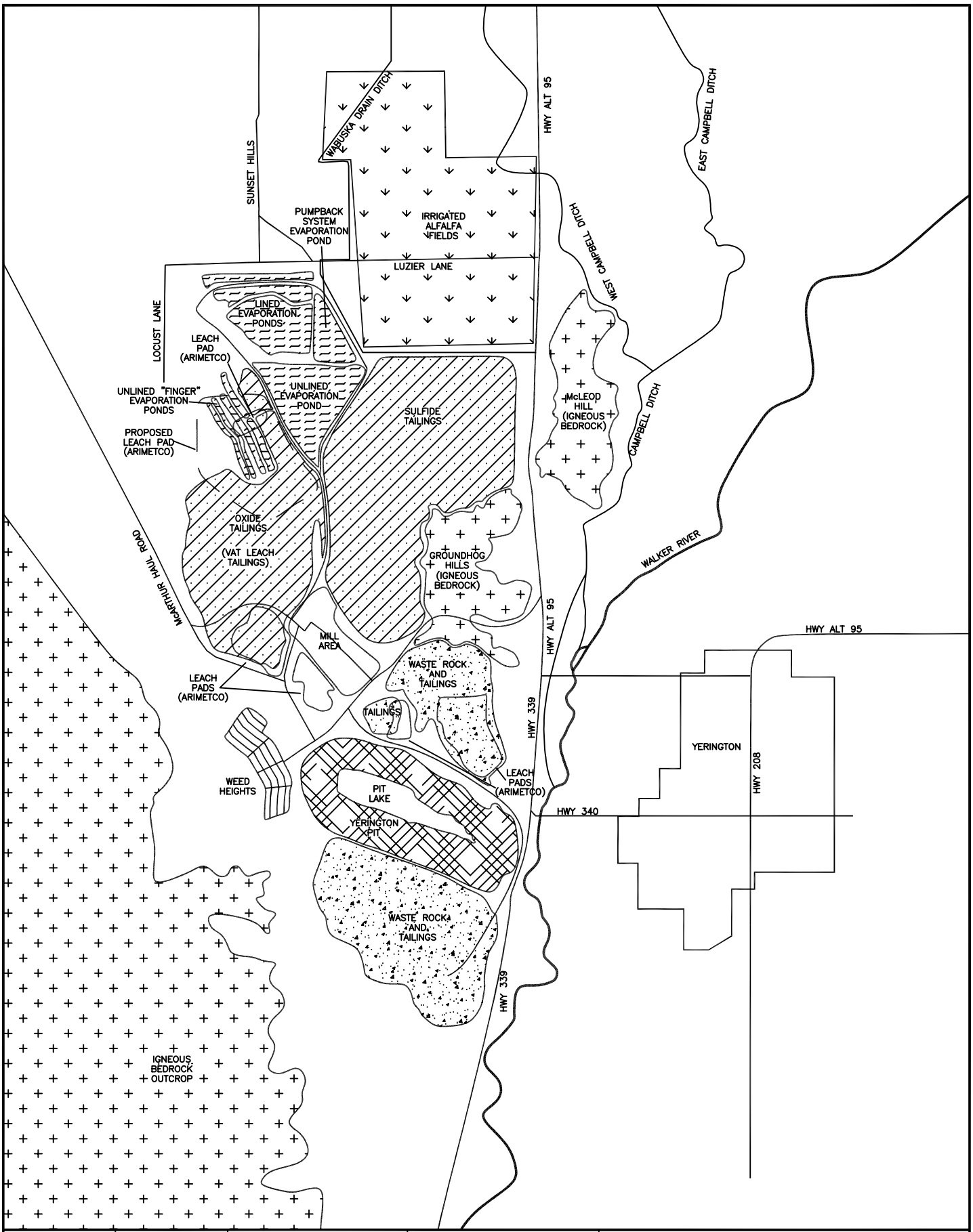


Route to South Lyon Medical Center

Depart the mine site using the main entrance road (named Burch Drive on the map, Figure 3A) heading east. Turn right (south) on Highway 95 and continue 0.1 miles to left turn for continuing on Highway 95. Turn left on to Highway 95 (aka Goldfield Avenue). Continue east on Highway 95 approximately 0.4 miles to Main Street. Turn right (south) on Main Street. Continue south on Main Street approximately 0.3 miles to Surprise Street. Turn right (west) on Surprise. Continue (three blocks) to Hospital at corner of Surprise and Whitacre. See Figure 3B next page.

FIGURE 3B
MAP OF ROUTE FROM MINE SITE TO HOSPITAL (Zoom scale)





DATE:	PROJECT NUMBER:	SCALE:
May 2002	21243	0 1500 3000 SCALE IN FEET

BROWN AND CALDWELL
Carson City, Nevada

Figure 1

Site Plan

ATLANTIC RICHFIELD COMPANY Notification Tree

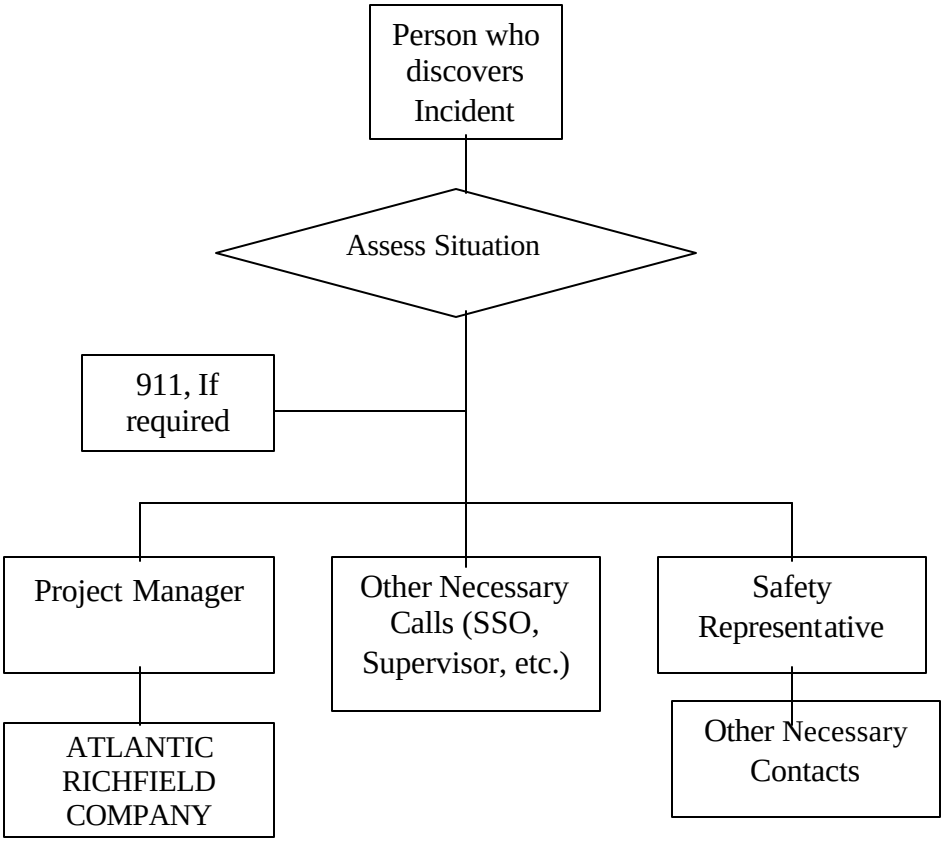


FIGURE 2
NOTIFICATION CALLOUT TREE